

# Level I:

WIC Certification Program



## Screening Module

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## Section I: How to Use This Module

The Screening Module covers best practices and current recommendations on how to accurately interpret, weigh and measure infants, children and women as well as perform hematological (hemoglobin or hematocrit) tests for anemia (low iron). This module contains required training activities that must be completed in order to successfully complete the Screening Module that can be found on the Colorado WIC website under WIC Certification Program or another website as indicated. The training activities include:

### **Videos to View:**

- ☐ How to Weight and Measure Infants, Children and Adults
- ☐ How to use the WHO Growth Charts
- ☐ [Colorado WIC Hemoglobin Testing training video](#)

### **Additional Activities:**

- ☐ Reviewing the hemoglobin/hematocrit level chart in your Mini Manual
- ☐ Reviewing the standards for severely low anemia in your Mini Manual
- ☐ Screening Module online post-test

## Section II: Introduction

When certifying/recertifying a WIC participant, it is necessary to collect certain information for screening purposes. Included in this information is height/length, weight and in most cases hemoglobin or hematocrit levels. This Screening Module explains the proper way to obtain and record this information. These measurements are used to assign nutrition risk factors during certification, recertification and mid-certification in the WIC Program. This information is also used to assess a participant's health, plan education and intervention, and monitor change. Additional screening functions include immunizations and blood lead level for infants and children and HIV status for pregnant women.

Height/Length and weight are called anthropometric measurements. Anthropometric measurements refer to measurements of the size of the body. Anthropometric measurements include weight, height, length, head circumference, abdominal circumference, skin fold, and other measurements. In WIC we are primarily concerned with weight and height/length. These terms will be discussed in this module. This module will also discuss how to interpret height, weight, and length information on the proper growth and weight charts for evaluation.

**Height:** Measurement of the distance from the top of the head to the bottom of the feet that is performed standing upright. This measurement is used for children two years of age and older.

**Length:** Measurement of the distance from the top of the head to the bottom of the feet that is performed lying down. This measurement is used for infants and children younger than two years of age and for children who cannot stand upright.

Both height and length measure stature, but height and length are NOT the same and cannot be used interchangeably.

Hematology is the term describing the study, etiology, diagnosis, treatment, prognosis, and prevention of blood diseases. In WIC we perform a hematological test to determine how much iron a participant has in their blood. Iron deficiency anemia is a common problem for pregnant women and growing children. The amount of iron in a person's blood is an indicator of whether there is enough iron in their body. Two types of hematological tests used to determine anemia are called a hemoglobin test and a hematocrit test. Local WIC agencies typically perform a hemoglobin test. Only the hemoglobin test will be discussed in detail in this module since it is the test performed by Colorado WIC clinics.

It is important that all measurements used in screening WIC participants be performed using a **standard procedure**. If two people perform a test in different ways the values cannot be compared and the information is not useful. If at a visit, a WIC educator weighs a pregnant woman with shoes and coat and at the next visit another educator weighs the woman without shoes and coat, it would be incorrect to compare the measurements. A woman may be gaining or losing weight inappropriately and we would not be able to tell.

Information gathered about weight and height is also compared against national standards such as growth charts or other charts. These charts are created using standard procedures. Unless these same standard procedures are used to obtain heights, lengths, weights, and hemoglobin in the local WIC clinics, the values cannot be compared to the ideal values of the national standards. The growth charts for children were developed using the weights of children wearing light clothing and no shoes.

**Here is an example to illustrate why standard procedures are important:**

An infant is weighed at a WIC certification visit. The WIC educator undresses the infant to weigh the infant nude. Compared to a previous weight at the WIC clinic the infant does not appear to be growing well. The infant should have gained more weight between the two visits. Because of the concerns expressed at WIC, the mother takes the infant to the pediatrician for a checkup later that afternoon. The nurse at the pediatrician's office weighs the infant, but this time the infant is weighed wearing a wet diaper and a couple of layers of clothing. The infant's mother is surprised to learn that her infant has gained almost a half a pound in the two hours since her WIC visit. The nurse tells the mother that her infant is gaining weight adequately compared to the previous WIC weight. For an infant a half-pound difference in body weight can mean the difference between identifying an infant with growth failure and one with adequate growth.

In this case the mother would be confused. WIC says there is concern about her infant's weight while the physician's office says there is no concern. Comparing the infant's weight to the standard growth charts, using WIC's weight the infant's growth appears poor, while using the physician's office weight the growth appears to be normal. If the WIC weight was used for assessment, then something can be done to help the mom improve the infant's growth. If the weight from the physician's office was used for assessment, then the infant would continue with poor growth. This could have long-lasting consequences for the infant's growth and development.

It is very important that all anthropometric and hematological tests be performed using **standard procedures**, otherwise the values are meaningless. For any type of measurement to give useful information it must be compared against some type of standard. In this module you will learn how to interpret the weights, heights, and lengths of infants and children on standard growth charts to evaluate their growth. You will learn to interpret the weight gain of a pregnant woman to determine if she is gaining weight appropriately. You will learn to compare hemoglobin/hematocrit values against charts to determine if a blood value for an infant, child, or woman is within a normal range.

*SELF-CHECK: PRACTICE YOUR KNOWLEDGE*

WIC performs two types of measurements; anthropometric and hematological. Give two examples of each type of measurement:

Anthropometric

1. \_\_\_\_\_
2. \_\_\_\_\_

Hematological

1. \_\_\_\_\_
2. \_\_\_\_\_

1. To measure the length of a child it is important to have the child stand upright with their back against the wall, looking straight forward.

A. True

B. False

2. Height means the same thing as length. Height and length can be used interchangeably when measuring a child.

A. True

B. False

3. Why is it important to always use the correct standard procedure when weighing or measuring a WIC participant? Give two reasons.

A.

B.

*ANSWERS*

1. Anthropometry: height, weight, length  
Hematology: hematocrit, hemoglobin
2. B. False. This is how height is measured.
3. B. False. Height and length are not interchangeable.
4. Measurements must be done by a standard procedure so that:
  - One measurement can be compared accurately to another
  - Measurements can be accurately compared against standards such as growth charts

## Section III: Anthropometry

Remember that anthropometry is the measurement of the size of the body. In WIC we measure stature (length & height) and weight. Standard techniques for performing these measurements are included in the next few pages.

### Measuring Stature

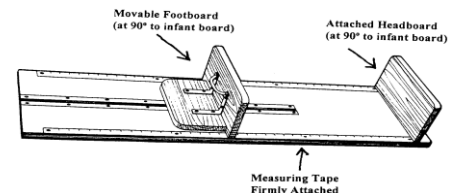
#### Length

Length is different than height. Length is measured while the participant is lying down or recumbent. Height is measured while the participant is standing up. These two measures are **not** interchangeable. When standing up, the backbone is compressed differently than when lying down. Therefore a person's height is usually different than their length. Length should always be plotted on a graph designed for length while height should always be plotted on a graph designed for height.

Infants and children up to the age of two years should have their length measured. Height is used for children two years of age and older. The Compass system is designed to assume that any measurement of stature is a length until the child is two years of age. Any value entered when the child is two years of age or older in the Compass system assumes the value is a height. A length measurement cannot be entered for a child over 24 months of age or older. If a length is measured for a child 24 months of age or older lying down, enter the measurement and select Inaccurate Reason with the selection of "recumbent measurement". If an inaccurate reason is selected, the plot on the grid will be in red indicating an inaccurate measurement.

#### Equipment

An infant measuring board with a rigid headpiece and a movable footboard is recommended. The footboard must form a 90-degree angle with the measurement surface. All edges of the board, headpiece, and footboard must be smooth and finished. Measurements should be readable to the nearest 1/8 inch.



#### Technique

- Two people are required to measure length.
- Any clothing that interferes with the measurement should be removed.
- An infant or child is laid on their back on the measuring board.
- One person holds the infant's head firmly against the headboard (infant's eyes should be pointed directly at the ceiling). The second person brings the infant's knees together and extends both of the infant's legs; one of the examiner's hands should rest on the infant's knees to prevent them from spreading or flexing while the other hand brings the movable foot board to rest firmly against the infant's heels (toes pointed upward).

- The length is read to the nearest 1/8 inch (round down). The information is recorded in the anthropometric panel of the Compass system.

**Length measurements will be automatically plotted on the appropriate growth chart in Compass.**

If a measuring board is not available, the following procedure may be used:

Securely attach a steel measuring tape to the top edge of a table. (Steel tape measures are preferable to cloth, plastic, or fiberglass as they do not stretch.) Create a right angle by securing a board to the end of the table. This forms a stationary headboard. Lay the infant on his back next to the measuring tape; the top of his head should be against the headboard and across from the marking on the measuring tape. Proceed as in step #3 when using a regular infant measuring board. Two people should hold the infant who is lying on his back. Legs should be extended, toes pointing upward. A portable footboard that makes a right angle with the board should be used to mark the bottoms of the feet. Record length to the nearest 1/8 of an inch where the heels touch the footboard. (Round down to the nearest 1/8 of an inch)

Measurements of length without a standard infant measuring board should be **rare**. All WIC clinics are equipped with measuring boards. If a board is not available, talk to your clinic supervisor or call your state nutrition consultant. Measurements without a board are limited to times while a clinic is waiting for a new board or an unusual situation when an infant or child must be measured outside of a clinic.

Note: One way to get babies to flex their toes when measuring length is to use the Babinski reflex. This reflex occurs when the great toe flexes toward the top of the foot and the other toes fan out after the sole of the foot has been firmly stroked. To encourage this reflex, staff can take the non-ink end of their pen and run it up the bottom of baby's foot. The baby flexes and the foot board can quickly be brought into place for length to be measured.

## **Maintenance**

The infant measuring board needs to be kept clean with soap and water. It should be checked monthly to ensure joints have not loosened, edges have not been damaged, or the board does not show other signs of wear. The footboard should be checked monthly and replaced if it no longer creates a right angle.

## **Height**

Height is a measure of how tall a person is while they are standing upright. In the WIC Program height is measured on participants who are at least 2 years of age.



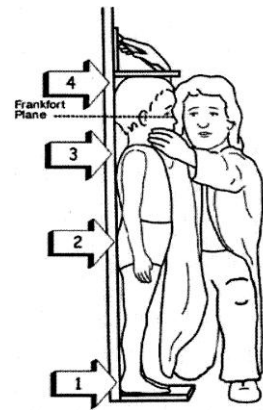
## Equipment

A wall-mounted measuring device, such as a stadiometer that is designed for the purpose of taking standing height, is the preferred form of equipment. The measuring device should be placed on a wall that has no baseboard or carpet to interfere with measurements. Baseboards prohibit a person from placing their heels directly against the wall, and carpet does not give a firm surface for an accurate measurement. Measuring rods attached to scales are not accurate and should not be used.

If a wall-mounted measuring device is not available a tape and headboard may be used temporarily. Secure a steel measuring tape to a vertical, flat surface such as a wall. The tape measure should be marked in 1/8 inch increments. The headboard needs to be large enough that when placed on the top of the head it will also touch the wall where the measuring tape is attached (a 6-inch board will usually work). The headboard needs to be able to form a right angle when touching the top of the head and the measuring tape.

## Technique

- Remove the child's or woman's shoes, hats, and bulky clothing such as coats and sweaters. Undo or adjust hairstyles and remove hair accessories that interfere with measurement.
- The child or woman should stand erect, with shoulders level, hands at sides, knees or thighs together, and his/her weight evenly distributed on both feet. The child's or woman's feet should be flat on the floor with both heels comfortably together and touching the base of the wall. When possible, all four contact points (i.e., the head, back, buttocks, and heels) should touch the wall while maintaining a natural stance (see figure in left margin). Some participants will not be able to maintain a natural stance if all four contact points are touching the wall. For these participants, at a minimum, two contact points, the buttocks and heels should always touch the wall.
- Position the participant's head so that they are looking straight forward.
- Lower the headpiece until it firmly touches the crown of the head and is at a right angle with the wall. Check contact points as in the figure on the left to ensure that the lower body is still in the proper position and that the heels remain flat on the floor.
- The measurement is recorded in the Anthropometric section of the Compass system. This information will be automatically plotted on the correct growth chart.
- Inaccurate length measurements can occur and reasons for this discrepancy need to be documented in the Anthropometrics panel in Compass. Possible reasons for inaccurate measurements include noncompliant/refused, special needs and other.



## Maintenance

The measuring device must be kept clean and free of stray marks. The device should be checked monthly to ensure that it is perpendicular to the floor and accurately and firmly attached to the wall. The headboard should be checked for signs of wear and replaced if loose, broken, or no longer creates a right angle with the wall.

## Using a Tape Measure Attached to the Wall

- Select an area where there is no baseboard or carpet and the wall is perpendicular with the floor. Stretching the tape over a baseboard or standing on carpet will distort the measurement.
- Place the end of the tape measure marked zero on the floor and secure it to the wall.
- Fully extend the tape upward on the wall. Lightly attach the tape to the wall.
- Double check placement of the measuring tape paying particular attention to the zero mark. Make sure the zero mark is still at the level of the floor. Also verify that the tape goes straight up the wall and does not veer to one side or the other as it goes up the wall.
- Secure the measuring tape snugly to the wall to prevent it from being accidentally torn from place.
- Reinforce the first four inches with tape.

Measurements without a standard measuring device should be **rare**. All WIC clinics must be equipped with measuring devices for height.

Note: Do not use movable measuring rods on platform scales to measure height. The head bar is unsteady, pliable (it bends), and too narrow to obtain an accurate measurement. The base (weighing platform) also sinks due to the weight of the participant, resulting in an inaccurately shortened height.

## SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. Until what age should a child's length instead of height be measured?

- A. \_\_\_\_\_ 3 months
- B. \_\_\_\_\_ 6 months
- C. \_\_\_\_\_ 1 year
- D. \_\_\_\_\_ up to 2 years
- E. \_\_\_\_\_ 3 years

2. A child who is exactly two years of age should be measured lying down (length) or standing up (height)

A. Length

B. Height

3. It is difficult for one person alone to obtain an accurate length measurement of an infant.  
A. True B. False
4. Using a measuring board is less accurate than using a measuring tape attached to a table.  
A. True B. False
5. The height of a participant can be measured with shoes on as long as the clinic is consistent and always measure the participant the same way.  
A. True B. False
6. When measuring a person's height, their buttocks and heels at a minimum should be touching the wall.  
A. True B. False
7. If a standard measuring device is not available, height can be measured using a steel tape measure attached to the wall and a magazine as a headboard.  
A. True B. False

### ANSWERS

1. D, up to 2 years
2. The correct answer is B, height.
3. A, True
4. B, False
5. False. Participants are always measured without shoes.
6. True
7. False

## Measuring Weight

Weight measurements are required on all WIC participants at certification and recertification visits and for infants at the mid-certification visit. Weight measurements for pregnant women should be taken at each prenatal visit. They are also highly recommended on infants at the three and nine month visits, and on any WIC participant at follow-up visits when there is concern about growth or weight gain.

Infants and children less than two years of age are generally weighed on an infant scale while either lying down or sitting on the scale. Children two years of age or older and women are weighed on an adult scale while standing upright.

## Infant Weight

This procedure should be used with infants and children less than two years of age. Children two years of age and older are weighed on an adult scale.

### Equipment

A scale with a tray and non-detachable free-sliding weights or a digital measurement scale is the recommended form of infant scale. The scale should be marked in increments of 1 ounce. The scale must have a zeroing adjustment (screw type preferred). The scale must rest on a firm, stable table. Spring balance scales (such as bathroom scales) are not recommended. The spring counter balance loses accuracy over time and many scales are not capable of reading more accurately than one-half pound.



### Technique

Weight should be obtained while the infant/child is nude or wearing only a dry diaper. If this is not possible it is important to record how the weight differed.

- A sheet of paper is placed on the scale to protect the infant from the cold metal plate. For sanitation reasons, the paper is changed after weighing each infant.
- The scale is balanced to zero with the paper on it.

- The mother is instructed to undress the infant and place her lying in the center of the scale. If the infant is capable of sitting on her own, the mother may place the infant sitting in the center of the scale. It is important to protect the infant from falling in this instance.
- Check to make sure the infant is not touching anything other than the scale's tray. Check feet and hands especially if they are hanging over the side of the scale weighing tray. Check around the scale to make sure infant clothing or other objects are not interfering with the free movement of the scale tray (sometimes a parent will put the infant's clothes under the scale as they undress the infant).
- The appropriate weights are moved back and forth until the arrow on the right-hand side of the scale rests in the exact center.
- The weight is recorded to the nearest ounce. Digital measurements are recorded to the nearest tenth of an ounce
- The weights are returned to the zero position at the left-hand side of the scale.
- The measurement is entered into the Anthropometrics panel of the Compass system.
- The information will be plotted automatically onto the appropriate growth grid in the Compass system.

Note: A frightened infant may be weighed in the mother's arms. The mother is weighed alone on an adult scale and then with the infant. The mother's weight is then subtracted from the combined weight. The WIC staff person obtaining a weight with this method must document in the Assessment portion of Compass using the Anthropometric panel. The Inaccurate Reason should be used and "weighed with adult" selected.

An infant or small child must be protected at all times to ensure they are not injured or do not fall during measurement of their weight or length.

## Maintenance

The scale must be kept in zero balance. The scale should be zeroed before each session and whenever the scale is transported. To zero the scale:

- Remove any objects from the scale.
- Place all the attached weights directly over the zero positions.
- Move the adjustable zeroing weight or screw until the arrow on the right-hand side of the scale rests in the exact center.

Scales need to be periodically checked to make sure they record accurate weights. This is done by weighing standard weights on the scale to determine if the scale gives the correct reading. For example a ten-pound weight could be put on the scale to determine if the scale gives a reading of exactly ten pounds. The weights used for this purpose are specially designed to weigh very exact amounts. Objects that weigh about ten pounds cannot be used to check the accuracy of the scale. For purposes of WIC, an infant scale should read within one ounce of the standard weight being tested.

Clinics are required to have their scales inspected annually by the Colorado Department of Agriculture Weights and Measures. If scales pass inspection, a Colorado Department of Agriculture approval sticker will be dated and placed directly on the scale.

If scales do not pass inspection, a blue Work Order sticker will be placed on the scale. Avoid using the scales until repairs have been completed. The scale should be tested any time there is suspicion the scale may be incorrect.

## Children and Adult Weight

### Equipment

A beam balance scale with a platform and non-detachable free-sliding weights is recommended. The scale should be marked in increments of not less than one-eighth ( $1/8$ ) pound. It must have a zeroing adjustment (screw type preferred). Beam balance scales as well as electronic scales are used in Colorado WIC clinics. The scale must rest on a firm, non-carpeted surface.

Note: Spring balance scales (such as bathroom scales) are **not** recommended. The spring counter balance loses accuracy over time and many scales are not capable of reading more accurately than one-half pound.



DO NOT USE

### Technique

- The participant is asked to remove all heavy clothing (such as coats, heavy sweaters, snowsuits) and shoes. The prenatal client must be weighed in light clothing consistently throughout pregnancy. Children must also be weighed in light clothing.
- Confirm that the sliding weights on the horizontal beam are in the zero position and that the scale is in balance.
- The participant is asked to stand in the center of the platform with her body upright and arms hanging naturally at her sides. It is important that the participant stand in the center of the scale in order to get an accurate weight.
- The appropriate weights are moved back and forth until the arrow on the right-hand of the scale rests in the exact center.

- The weight measurement is read and recorded to the nearest  $\frac{1}{4}$  pound
- The weight measurement is recorded in the Anthropometrics panel in Compass.
- Return the weights to the zero position on the left-hand side of the scale.
- Record the information in the Compass system.

Note: It is important to respect the participant's confidentiality and sensitivity concerning their weight. Care should be taken to not embarrass the participant by announcing their weight in such a way that others in the clinic may hear it.

## **Maintenance**

The scale must be kept in zero balance. The scale should be zeroed before each session and whenever the scale is transported. Refer to the section on measuring weight for infants for information on maintaining the scale and making periodic checks of the scale's accuracy.

## **Participants who are unable to stand or are too large to be weighed**

- When participants are unable to stand due to physical impairment, investigate other ways of weighing. Children's weights may be obtained in their parents' arms. The parent is weighed first and then the parent and child are weighed together. The child's weight is obtained by subtracting the two weights. The reason for the possible inaccuracy in weighing must be documented in the Anthropometrics panel in Compass. The drop down list for inaccurate weight includes excess clothing, infant/child with wet/dirty diaper, noncompliant/refused, special needs, weighed with an adult and other. For adults who are unable to stand it may be possible to find other facilities where a weight can be obtained, for example a clinic or physician's office where the adult receives health care or therapy. Ask the participant to bring weight measurements with them to their WIC appointments. Weights obtained outside the WIC clinic are acceptable up to 60 days from the appointment date. Again, notation should be made in the care plan as to where or how the weight was obtained.
- If a participant's weight is too great to be measured on the WIC scale, ask if the participant is being weighed at their physician's office. If the answer is yes, ask them to bring their weight to the WIC appointment. It is important to respect the integrity of the participant under such circumstances. If weight is unavailable, it may be necessary to forego obtaining a participant's weight. Under these circumstances the participant's nutrition care and assessment need to be redirected to look more closely at diet or the participant's perception of her weight rather than on actual weight gain or loss. Participants in this situation should be seen by the WIC RD/RN for assessment and follow up. Notation should be placed in the participant care plan explaining why a weight was not obtained.

### SELF-CHECK: PRACTICE YOUR KNOWLEDGE

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## ANSWERS

1. A, True
2. B, False
3. B, Ounce
4. B, False
5. A, True
6. B, False
7. Document the inaccurate reason as “weighed with adult” in the Assessment portion of Compass

## General Information Regarding Stature and Weights

### Required Measurements for Infants and Children

Stature and weight data must be collected on infants and children when they are being certified or recertified on the WIC Program. This information is necessary for assessment and certification on the WIC Program. Length and weight measurements are also required at the mid-certification visit for infants and children. For Infants, a mid-certification is at 5-7 months of age. For children, the mid-certification happens approximately halfway through the certification period or 5-7 months after the certification/recertification visit. Lengths and weight for infants are recommended at 3 and 9 months of age for the purpose of assessing growth.

### Length and Weight Measurements for Infants

#### Required

- Certification Visit
- Mid-certification Visit (5-7 months of age)\*

#### Recommended

- 3 Months
- 9 Months

\*A parent may refuse to allow length and weight measurements at the mid-certification visit for an infant. The mid-cert measurements, however, are very important for assessing the health of a growing infant. In the event a parent refuses to allow the measurements, staff should explain the importance of the mid-certification assessment to encourage the parents to give the necessary permission to obtain the measurements. WIC benefits may not be withheld because a parent refuses lengths and weights at a mid-certification visit.

## **Stature and Weight Measurements for Children**

### Required

- Certification/Recertification Visits
- Mid-certification Visit (5-7 months into certification period)

### **Measurements Brought to the Clinic**

Parents may bring stature and weight measurements from a physician's office or similar source. These measurements may be used for certification/recertification or the infant's mid-certification assessment visit. The measurements, however, may not be more than 60 days old. When using measurements that were not taken at the WIC visit, it is important to know the date the measurements were taken. The date the measurements were taken, needs to be entered into the measurement date field on the Anthropometric panel in Compass.

When a parent brings stature and weight measurements from a physician's office it may still be desirable to obtain current measurements in the WIC clinic. This is especially true for infants and for measurements that are more than a few days old. While regulations allow measurements to be 60 days old, measurements that are more than a few days or weeks old may not give a good assessment of the current health of an infant or child. Stature and weight measurements brought into the WIC clinic must be from a reliable source. Measurements generally need to be performed by health care professional using standard measuring procedures as outlined in this module. Measurements taken by parents on a home scale or with a tape measure are not acceptable. Measurements must also be accurately communicated with the WIC clinic. Verbal reports from parents may not be accurate. Many clinics require that the measurements be written on prescription pads or letterhead from the health care provider's office. Each local WIC agency has its own policy with respect to stature and weight measurements taken outside of the WIC clinic. Ask your supervisor about your clinic's policy.

One challenge for all WIC clinics is explaining to parents why measurements taken in WIC clinics do not exactly match those taken in other places. There are a number of reasons why the measurements may not match. Scales and measuring devices for height and weight vary somewhat from place to place. Ideally all scales and devices are properly calibrated and maintained to give accurate values, but this is not always the case. Also, not all health care personnel choose to follow the same standard procedures for performing measurements. Ask the parent if the infant was weighed dressed or with a diaper. Was the child wearing their shoes or coat when measurements were performed? Finally, the weight of the human body does vary over the course of a day. A baby will weigh more before having a bowel movement or before emptying his/her bladder. A baby will weigh less just before they eat.

Variation in measurements from one location to the next is a good reason to encourage that measurements be made at your clinic whenever weights are required or needed. Comparisons of measurements are most accurate when they are performed on the same equipment, using the same standard procedure. WIC is very concerned about obtaining accurate stature and weight measurements. It is the reason for this module. It is the reason clinic equipment needs

to be carefully maintained and inspected. It is also the reason WIC staff members are periodically evaluated for their ability to obtain accurate measurements.

### **Required Measurements for Women**

Weight measurements are required for women at each certification/recertification visit. Weights are also required each trimester for pregnant women. Heights are required for adult women only at their initial certification visit since adults generally do not change height. Growing adolescent women under age 18, however, need to have their heights measured at each recertification visit. Height and weight measurements must be performed on women. It is not acceptable for a woman to self-report her height or weight since self-reported measurement data can often be inaccurate.

As with infants and children, women may bring measurements from a health care provider as long as the measurements are not more than 60 days old **and** as long as the measurements were taken during the woman's current physiological status. For example, the weight of a pregnant woman must be taken during the time she is pregnant, the weight of a postpartum woman must be taken after she is no longer pregnant.

It is **not recommended** that weights taken outside of the WIC clinic for pregnant and postpartum women be routinely accepted if they are not current. Weights can change fairly rapidly during pregnancy and the postpartum period. A pregnant woman may bring a weight measurement from her doctor that was taken 2 weeks ago before she experienced significant nausea and vomiting. That weight would have very little meaning today and it may mean that WIC staff would miss an important opportunity to help the woman with a significant nutritional problem.

### **Height and Weight Measurements for Women**

#### **Required**

- Certification/Recertification Visits

\*Weight each trimester for pregnant women

\*Height is only required at the initial certification visit unless the woman is under 18 years of age. Women under age 18 need to have their height measured at each certification and recertification visit.

### **Data Entry**

**ALL** height and weight data collected at any WIC visit should be entered into the Compass system. This is true even of data collected at follow-up visits. This helps to give a more complete picture of a WIC participant's health status. This is especially important when participant data is transferred from one WIC agency to another.

Occasionally a measurement obtained will be outside of a range that the Compass system recognizes. A message will pop up that says the measurement is *outside of the expected range*. This is only a warning and the measurement can be entered and saved in the system. The Compass system does have high and low parameters for weight, length and height and will not allow any measurements outside this range to be entered and saved. If this occurs, check carefully to make sure your measurements are correct as the parameters are set with a wide normal range for each age. Data for weight can be entered without stature and vice versa.

### **Common Measurement Errors**

As stated earlier, it is very important to collect stature and weight data in a standardized manner. Inaccurate measurements are of little value and can result in inaccurate assessments nutritional status. This can have serious health consequences for the participant. Some of the more common measurement errors that occur include:

#### **For all measurements:**

- Inaccurate equipment
- Wrong equipment
- Restless or fearful child who makes measurements difficult
- Reading equipment incorrectly
- Recording information incorrectly

#### **For length:**

- Incorrect instrument for age
- Footwear or headgear not removed
- Head not held straight above body
- Head not firmly against fixed end of board
- Child not straight along board
- Body arched
- Knees bent
- Feet not parallel to movable board (toes not pointing toward ceiling)
- Board not firmly against heels
- Only one leg used for measurement

#### **For height:**

- Incorrect instrument for age
- Footwear or headgear not removed
- Feet not straight or flat on floor
- Feet not back against tape measure
- Knees bent
- Body arched or buttocks forward (body not straight)
- Shoulders not straight or touching tape measure

- Head not straight above body and eyes looking forward
- Headboard not firmly on crown of head
- Headboard does not form right angle with wall (for non-attached headboards)
- Inappropriate headboard used (for non-attached head boards)

**For weight:**

- Scale not adjusted to zero before weighing
- Infant/child not weighed nude or in dry diaper (two years of age or younger)
- Child or woman weighed with heavy clothing and/or shoes
- Infant or child moving
- Child or woman holding toys, bottle, or holding onto scale
- Parent holding child to steady them on scale
- Clothing or other objects placed under scale that affects its movement

When height, length, or weight values appear too abnormal, staff may want to consider re-measuring the woman or child. For example, if a child's weight has changed dramatically since the last visit, the child has decreased in stature or weight, or a pregnant woman has a very high increase in weight it may be wise to redo the measurements. Many things can happen that would cause measurements to be incorrect. Before worrying the participant or sending a false message to a physician, it is better to recheck the measurement to be sure it is correct.

*SELF-CHECK: PRACTICE YOUR KNOWLEDGE*

1. All measurements taken on participants in the WIC clinic should be entered into the Compass system including stature or weight measurements taken after the certification visit.  

A. True  
B. False
2. Infants should be weighed in light clothing with their shoes and coats removed.  

A. True  
B. False
3. A pregnant woman may self-report her height when being certified on the WIC Program.  

A. True  
B. False
4. It is recommended that pregnant women be weighed at each WIC visit.  

A. True  
B. False

5. How old may height and weight information be to be used to certify a participant on the WIC Program? \_\_\_\_\_
6. At what age are mid-certification visits performed for infants? \_\_\_\_\_  
\_\_\_\_\_
7. List two reasons why an infant's weight at the doctor's office two hours ago may be different than their weight right now in the WIC clinic:
  - A.
  - B.

## ANSWERS

1. A, True
2. B, False
3. B, False
4. A, True
5. 60 days old
6. 5-7 months of age
7. Any two of the following:
  - Scales are different
  - Scales are not calibrated correctly
  - Different technique is used, for example an infant may be weighed dressed or may be weighed with shoes or a heavy coat
  - Infant may have eaten, emptied his/her bladder, or had a bowel movement between the visits

## Training Activity

### Video: How to Weight and Measure Infants, Children and Adults

Before proceeding take 10 minutes to view this posted video located on the [Colorado WIC website](#) under Local agencies >WIC Certification Program.

## Compass Growth Charts

### What Are Growth Charts?

Growth charts are designed to represent the normal growth of healthy children. For infants and children ages 0-24 months of age, the WIC Program uses the World Health Organization (WHO) standard growth charts. All measurements taken while the infant or child was less than 24 months of age will be plotted on these charts. The WHO growth charts are based on healthy, breastfed infants and young children from diverse ethnic backgrounds and cultural settings. For children 24 months of age and older, the WIC Program uses charts developed by the National Center for Health Statistics (NCHS) for the Centers for Disease Control and Prevention (CDC). These charts were developed from studies on normal, healthy children in the United States. Both types of growth charts have separate charts for boys and girls. The boys' and girls' charts are divided into those for infants and children 0-24 months of age and those for children 2-5 years of age.

The Colorado WIC Program uses the following individual growth charts for growth assessment: length for age, weight for age, weight for length, stature for age, and BMI for age.

The WHO growth charts contain smoothed percentile curves depicting growth percentiles of 2, 5, 10, 25, 50, 75, 90, 98. The CDC growth charts contain smoothed percentile curves depicting growth percentiles of 5, 10, 25, 50, 75, 90, and 95. Each percentile serves as a reference for comparison. For example, a female child, age 3, who is at the 25th percentile height-for-age is taller than 25% of the girls her age and shorter than 75% of the girls her age. Any child over 24 months whose height is between the 10th and 90th percentile is considered to be in the "normal range."

### Recording Measurements

Recording measurements from two or more visits provides a visual presentation of a child's growth pattern. In theory a child whose height is at the 25th percentile should continue to grow so that her height stays at the 25th percentile over time. This is not always true. However, the greater the variation from a percentile line the more concern there is that something unusual is going on with the child's growth. Growth that varies greatly from a normal growth line needs to be referred to the WIC RD/RN for evaluation. Growth charts are an important tool for assessing a child's nutritional status since nutrition plays a major role in growth. Poor growth can indicate poor nutrition (though poor growth can also result from other factors such as illness). The information must always be entered into the Compass system. For the growth charts to correctly reflect the percentiles calculated by Compass the following must occur:

#### 0-24 months Growth Charts:

Enter the Anthropometrics panel and select "New" to create a record for today. Enter weight with fraction, decimal or metric measurements. Available growth charts include Weight for



Age, Length for Age and Weight for Length. Compass charts display age in increments of three months beginning with birth. Weight is displayed in increments of 2 pounds. Length is displayed in increments of 1 inch.

### **2-5 years Growth Charts:**

Enter the Anthropometrics panel and select “New” to create a record for today. Enter weight with fraction, decimal or metric measurements. Available growth charts include Weight for Age, Stature for Age and BMI for Age. Compass charts display age in increments of 2 months beginning with 2 years. Weight is displayed in increments of 1 pound. Height is displayed in increments of 1 inch.

### **Body Mass Index (BMI):**

Body Mass Index (BMI) is a ratio of a person’s weight to their height. It is used to determine whether a person is at a healthy weight. BMI-for-age is an anthropometric index of weight and height combined with age. BMI-for-age is used to screen children 24 months of age and older and adolescents as underweight, overweight, or at risk of overweight, in order to identify children who may need further assessment and possible treatment. Expected values for children’s BMI’s are different than for adults. An advantage of using BMI-for-age is that it can be used continuously from age 2 years through adulthood. BMI is a screening tool used to identify individuals who are underweight or overweight. BMI is NOT a diagnostic tool – in other words; we are not diagnosing overweight when we plot a child’s BMI-for-age. In WIC we use BMI to screen for risk factors and to assess growth.

BMI Calculation:  $BMI = (\text{Weight in Pounds} / (\text{Height in inches} \times \text{Height in inches})) \times 703$

After height and weight have been entered and saved into Compass, BMI and BMI-for-age will be automatically calculated by the Compass system. The BMI and the child’s age will be plotted on the BMI-for-age grid. The resulting plot mark will be the child’s BMI-for-age percentile. The current BMI is located in the upper right hand area of the Anthropometric panel.

For more information on BMI-for-age and overweight in childhood, go to:

<http://www.cdc.gov/nccdphp/dnpa/growthcharts/training/modules/module1/text/mainmodules.htm>

The Compass system provides several web links to special growth charts that include CDC Growth Charts for Special Needs, Down syndrome and Premature Growth Charts.

## What Do Growth Charts Tell Us?

Height and weight plotted at one age gives information as to how a child ranks in size in relation to other children of the same sex and age (overweight, underweight, or normal weight).

BMI-for-age tells us the same information for children older than 2 years.

Several measurements plotted at different age's gives information on whether the child's growth is progressing adequately. Most children stay at approximately the same percentile during growth, although some change above and below are normal.

Measurements <10th and >85th may indicate the child is at risk for medical/nutritional problems and should be carefully checked for accuracy; referral may be indicated.

Heights and weights between the 10th and 90th percentiles are considered in the normal range. Some people think that everyone should be at the 50th percentile, however, this is incorrect. It is normal for some children to be at the 25th percentile or even the 10th percentile. One height and weight measurement cannot tell if a child is growing well or not. If a child is only seen once and both his height and weight are at the 50th percentile, it may be tempting to say the child has "normal" growth. For this to be true we would need to know where the child was in the past. If the child had been at the 80th percentile 6 months ago and now is at the 50th percentile then the child's growth may not be "normal" and there may be reason for concern.

## Growth Assessment for Infants and Children

### At Risk of Underweight - NRF 103A (Low Risk)

This is a system assigned risk factor for an infant or child < 24 months of age with a weight-for-length > the 2nd percentile and ≤ the 5<sup>th</sup> percentile. It is also system assigned for children ≥ 24 months of age with a BMI-for-age > the 5<sup>th</sup> percentile and ≤ the 10<sup>th</sup> percentile.

### Underweight - NRF 103B (High Risk)

This is a system assigned risk factor for an infant or child < 24 months with a weight-for-length ≤ the 2nd percentile. It is also system assigned for children ≥ 24 months of age with a BMI-for-age ≤ the 5<sup>th</sup> percentile.

### Obese- NRF 113 (High Risk)

This is a system assigned risk factor and is only risked for children 2-5 years of age. It is assigned when the BMI-for-age or weight-for-stature is ≥ the 95<sup>th</sup> percentile. This is based on standing height measurements.

## **Overweight or At Risk of Becoming Overweight- NRF 114 (Low Risk)**

### **At Risk of Becoming Overweight**

This is a system assigned risk factor and is risked for infants (< 12 months) when the biological mother has a BMI  $\geq 30$  at the time of conception or any point in her first trimester of pregnancy.

It is risked for children  $\geq 12$  months of age when the biological mother has a BMI  $\geq 30$  at the time of certification. If the mother is pregnant or has had a baby within the past 6 months, use her preconception weight to assess for obesity.

For children < 24 months of age whose biological mother was on WIC during the most recent pregnancy, Compass will assign using the biological mother's most recent pregnancy record.

It is also risked for infants and children from birth to 5 years when the biological father has a BMI  $\geq 30$  at the time of certification. BMI must be based on self-reported weight and height by the father in attendance, not reported by the other parent.

### **Overweight**

This is a system assigned risk factor and is risked for children  $\geq 24$  months years of age when the BMI- for- age is  $\geq$  to the 85<sup>th</sup> percentile and < the 95<sup>th</sup> percentile.

## **High Weight-for Length - NRF 115 (Low Risk)**

This is a system assigned risk factor and is risked for infants and children < 24 months of age who are  $\geq 98^{\text{th}}$  percentile weight-for length.

## **At Risk for Short Stature - NRF 121A (Low Risk)**

This is a system assigned risk factor for an infant or a child. For infants and children birth to <24 months, the system assigns at > 2<sup>nd</sup> percentile and  $\leq 5^{\text{th}}$  percentile length-for-age. It is assigned for premature infants based on adjusted gestational age. For children ages 2-5 years, the system assigns > 5<sup>th</sup> percentile and  $\leq 10^{\text{th}}$  percentile stature-for-age.

## **Short Stature - NRF 121B (Low Risk)**

This is a system assigned risk factor for an infant or a child (<24 months) with a length-for-age  $\leq 2^{\text{nd}}$  percentile, based on adjusted gestational age when applicable (<24 months). For children ages 2-5 years the system assigns when height-for-age is  $\leq 5^{\text{th}}$  percentile.

### **Low Birth Weight – NRF 141A**

**(High Risk for infants < 12 months; Low Risk for children 12 - <24 months)**

This is a system assigned risk factor for infants and children < 24 months of age born with a birth weight of  $\leq 5$  pounds 8 ounces ( $\leq 2500$  grams).

### **Very Low Birth Weight – NRF 141B**

**(High Risk for infants < 12 months; Low Risk for children 12 - <24 months)**

This is a system assigned risk factor for an infants and children < 24 months of age born with a birth weight of  $\leq 3$  pounds 5 ounces ( $\leq 1500$  grams).

### **Prematurity – NRF 142 (Low Risk)**

This is a system assigned risk factor for an infant or child <24 months of age born  $\leq 37$  weeks/0 days gestation. Anything greater than 37 weeks/0 days is not considered prematurity (i.e.: baby born at 37 weeks and 1 day.)

### **Large for Gestational Age (LGA) – NRF 153 (Low Risk)**

This is a system assigned risk factor for an infant born with a birth weight  $\geq 9$  pounds ( $\geq 4000$  g.). This risk factor is based on the birth weight entered on the Anthropometrics panel.

### **Inadequate Growth – NRF 135**

**Infants:** *Birth to 1 month of age* – system assigned; **(High Risk)**

- Current weight less than birth weight at 2 weeks of age or greater; or
- Excessive weight loss after birth (current weight is  $\leq 92\%$  of birth weight).

Both of the above criteria are automatically assigned by Compass and require further assessment and counseling by the WIC High Risk Counselor within 24 hours of risk identification.

**Infants:** *One month to 12 months of age* – user assigned; **(High Risk)**

Any weight gain that is less than the expected weight gain from the “*Minimum Expected Weight Gain Tables*”<sup>\*</sup> using current weight and the most recent previous weight (as permitted by the tables).

Further assessment and counseling is required by the WIC High Risk Counselor within 30 days of risk identification.

**Children:** *Ages 12 months to 5 years* – user assigned

This risk factor is defined as any weight gain that is less than the expected weight gain from the “*Minimum Expected Weight Gain Tables*”<sup>\*</sup> using current weight and the most recent previous weight (as permitted by the tables). Children meeting this criterion **only** are considered **Low Risk**. Further assessment is needed in order to determine high risk identification for NRF 135, Inadequate Growth, see below.

### **High Risk Identification - NRF 135**

When weight gain is less than the expected weight gain from the “*Minimum Expected Weight Gain Tables*” and one of the following conditions is also present:

- Growth drops two channels in 6 months or less for weight-for-age, length/height-for-age, or weight-for-length/height, or BMI-for-age; or
- Weight loss or no weight gain between two weights taken at least 3 months and no more than 6 months apart; or
- Both weight-for-age and length-for-age are less than the 5<sup>th</sup> percentile.

Refer to the WIC High Risk Counselor within 30 days.

#### Exception:

Child (>12 months) was previously assigned NRF 113 (BMI for age was  $\geq$  the 95<sup>th</sup> percentile). At current WIC visit, child’s growth does not meet minimum expected weight gain. Refer to WIC High Risk Counselor only when one or both of the following conditions are present:

- Current weight is < 75<sup>th</sup> percentile BMI-for-age; -or-
- Weight loss or inadequate weight gain was due to illness, food insecurity, or improper dietary/feeding practices.

\*Minimum Expected Weight Gain (MEWG) Tables are located in your Mini Manual under Assessment Tools.

## **Training Activity**

### **Video: How to Use the WHO Growth Charts**

Before proceeding take 15 minutes to view this posted video located on the [Colorado WIC website](#) under Local agency >WIC Certification Program.

## Section IV: Minimum Expected Weight Gain (MEWG) Tables

The Minimum Expected Weight Gain (MEWG) tables, located in your Mini Manual under the Assessment Tools section, are used to assess whether the infant/child has gained adequate weight. If an infant or child's weight gain is less than the number derived from the chart for that particular time period, they should be risked with Inadequate Growth or Potentially Inadequate Growth – NRF 135. All numbers in the tables are given in ounces. Compass does not automatically assign inadequate growth for infants over one month of age. Therefore, infants one month and older and all children must be assessed for inadequate growth at every certification, recertification, and mid certification visit or each time measurements are taken.

Note: There is no reason to calculate for inadequate growth when the infant or child is following their growth channel. Following their growth channel is considered adequate growth.

The MEWG Tables 1-4 reflect changes in weight gain for an infant  $\geq 1$  month and  $< 12$  months of age. The horizontal numbers indicate the prior age in months and weeks and the vertical numbers indicated the current age in months and weeks. The number includes a number for months followed by a decimal and then a number for weeks. (3 months.3 weeks) The number for the minimum expected weigh gain is then determined by locating the box in the chart that includes both ages. The number in this box is the minimum amount of weight gain in ounces that the infant must gain. If the weight gain in ounces is below this number, you must risk the infant for inadequate growth – NRF 135. Remember that there are 16 ounces in 1 pound.

**Follow these steps to assess for inadequate growth using the MEWG tables:**

***Infants from 1 month to 12 months of age (MEWG tables #1-4):***

On the Weight for Age chart accessed from the Anthropometric Panel:

1. Look at the previous measure record.
2. Note the age in months and days.
3. Look at today's measurement record.
4. Note the age in months and days.
5. Use the chart below to convert the age to months and weeks.
  - To calculate weeks from days:
    - From 0 to 5 days = 0 weeks
    - From 6 to 11 days = 1 week
    - From 12 to 18 days = 2 weeks
    - From 19 to 25 days = 3 weeks
    - Over 25 days, add a month and 0 week

6. Using the MEWG Charts (Tables #1-4), determine the minimum expected weight gain.
7. Look at the Wt Chg (Weight Change) between the last two visits and convert to ounces.  
If the weight change is less than the minimum expected weight gain, check the “135 - Inadequate Growth” box on the anthropometric panel.
8. If the period of time between the last two weights recorded cannot be assessed using the MEWG tables, then inadequate growth cannot be assessed.
9. Infants assigned NRF 135 who are less than 1 month of age must receive high risk consultation within 24 hours. Infants older than 1 month of age assigned NRF 135 must receive high risk consultation within 30 days of risk identification.

**Example:** (\*Tip → 16 ounces = 1 pound)

- Today’s age: 3 months, 3 weeks (3.3) - vertical
- Previous age: 1 month (1.0) - horizontal
- Today’s weight: 12 pounds = 192 ounces
- Previous weight: 9 pounds, 5 ounces = 149 ounces
- MEWG: 58 ounces
- Actual change in weight: 192-149 = 43 ounces

\*The infant did not meet MEWG and must be assigned NRF 135 – Inadequate Growth

### **Children over 12 months of age (MEWG table #5):**

On the Weight for Age chart accessed from the Anthropometric panel:

1. Look at the age in years and months next to the previous measurement date.
2. Look at the age in years and months next to today’s measurement date.
3. Determine the difference in time between today’s age and the age of the previous measurements.
4. Use the MEWG Chart for children > 12 months (Attachment 135-A, Table #5) to determine the minimum expected weight gain (use column 3).
5. If the weight change is less than the minimum expected weight gain, check the “135 - Inadequate Growth” box on the anthropometric panel.
6. Assignment of NRF 135 to children can be either low or high risk.

### **NRF 135 High Risk Criteria for Children**

Assign High Risk and refer to the WIC High Risk Counselor within 30 days when at least one of the following conditions is also present:

- Growth drops two channels in 6 months or less for weight-for-age, length/height-for-age, or weight-for-length/height, or BMI-for-age; or
- Weight loss or no weight gain between two weights taken at least 3 months and no more than 6 months apart; or
- Both weight-for-age and length-for-age are less than the 5<sup>th</sup> percentile.



Exception: Child (>12 months) was previously assigned NRF 113 (BMI for age was  $\geq$  the 95<sup>th</sup> percentile). At current WIC visit, child's growth does not meet minimum expected weight gain. Refer to WIC High Risk Counselor only when one or both of the following conditions are present:

- Current weight is < 75<sup>th</sup> percentile BMI-for-age; -or-
- Weight loss or inadequate weight gain was due to illness, food insecurity, or improper dietary/feeding practices.

**Example:** (\*Tip → children > 12 months should gain 2.7 ounces/month)

- Today's age: 3 years 2 months
- Previous age: 2 years 8 months
- Difference: 6 months
- MEWG: 16 ounces
- Actual change in weight: 5 ounces

\*The child did not meet MEWG; if this is the only criteria – low risk

If any of the other criteria described in the NRF 135 definition are present – high risk

Table #5 Modified MEWG Table for Children > 12 months\*

Column 1	Column 2	Column 3
Change in months	Policy: <i>FNS MEWG Weight Change</i>	For staff: <b>Guidance for Compass Entry and NRF Assignment</b> <i>MEWG Weight Change</i>
3	8.1 ounces or (0.51 lbs)	8 ounces or (1/2 pound)
4	10.8 ounces or (0.675 lbs)	10 ounces or (3/4 pound)
5	13.5 ounces or (0.84 lbs)	13 ounces or (3/4 pound)
6	16.2 ounces or (1.01 lbs)	16 ounces or (1 pound)
7	18.9 ounces or (1.18 lbs)	18 ounces or (1 1/4 pound)

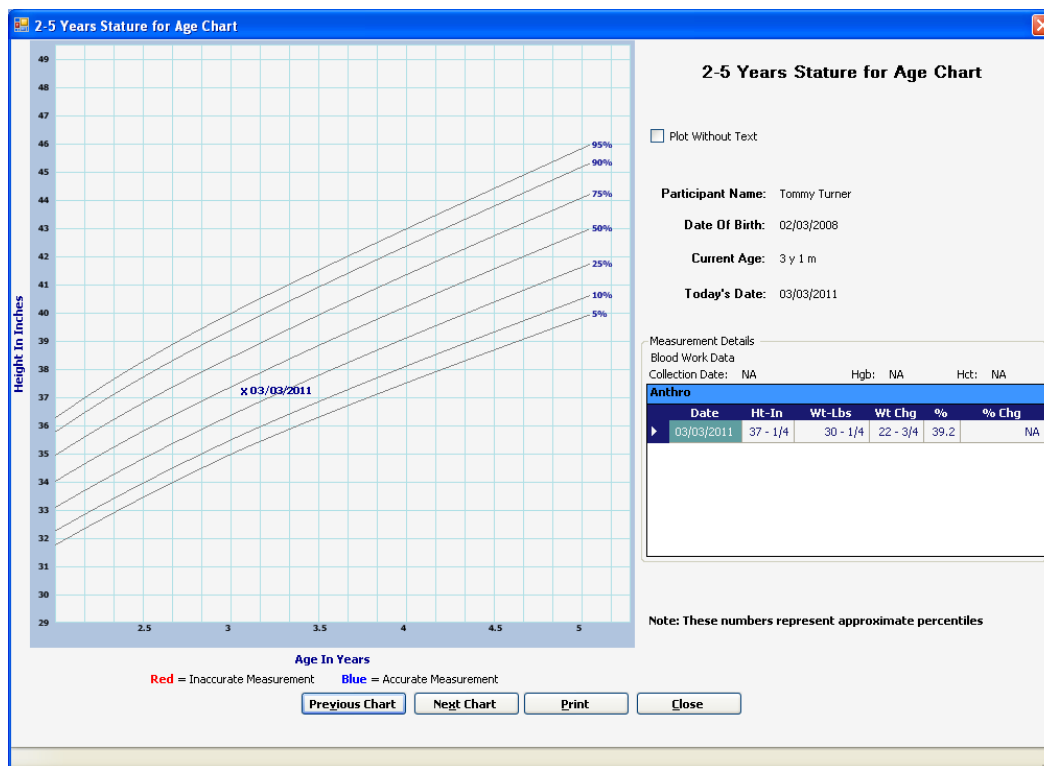
\*Children should gain 2.7 ounces/month



## Case Study

Tommy Turner is a 3-year-old boy being certified on the WIC Program for the very first time today. He weighs 30  $\frac{1}{4}$  pounds and is 37  $\frac{1}{4}$  inches tall. His BMI is 15.3 and today's date is March 3, 2011. Tommy's birthday is February 3, 2008.

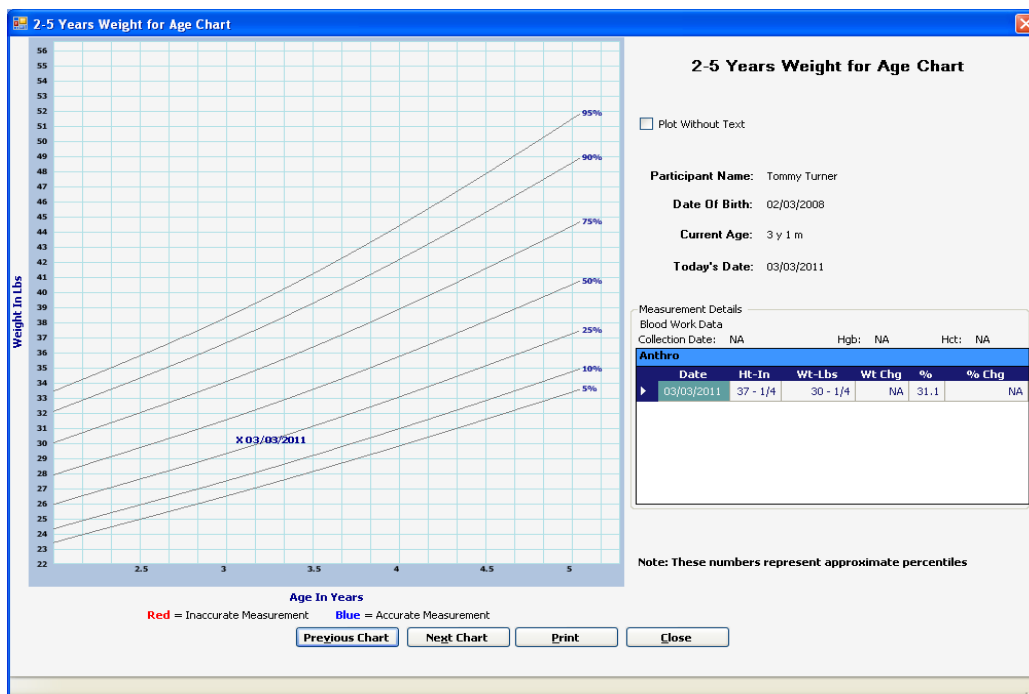
Stature for Age Chart:



Because Tommy is more than 2 years of age, the 2-5 years Charts are used in Compass.

- The title of the chart is displayed at the top of the screen.
- Participant Name, Date of Birth, Current Age and Today's Date are all displayed.
- In the table on the right-hand side of the screen is a grid that includes, the date, his height, his weight, and his weight change or BMI, and age are populated into the grid.
- The vertical and horizontal labels on the chart display the type of anthropometric measurement and the type of standard used.
- The current measurement will be displayed with an X along with the date on the growth chart.
- The growth chart % indicates at which percentile the measurement is plotted. For example, Tommy's weight for age is 31.1%, his stature for age is 39.2%, and his BMI for age is 26.7%.

## Weight for Age Chart:

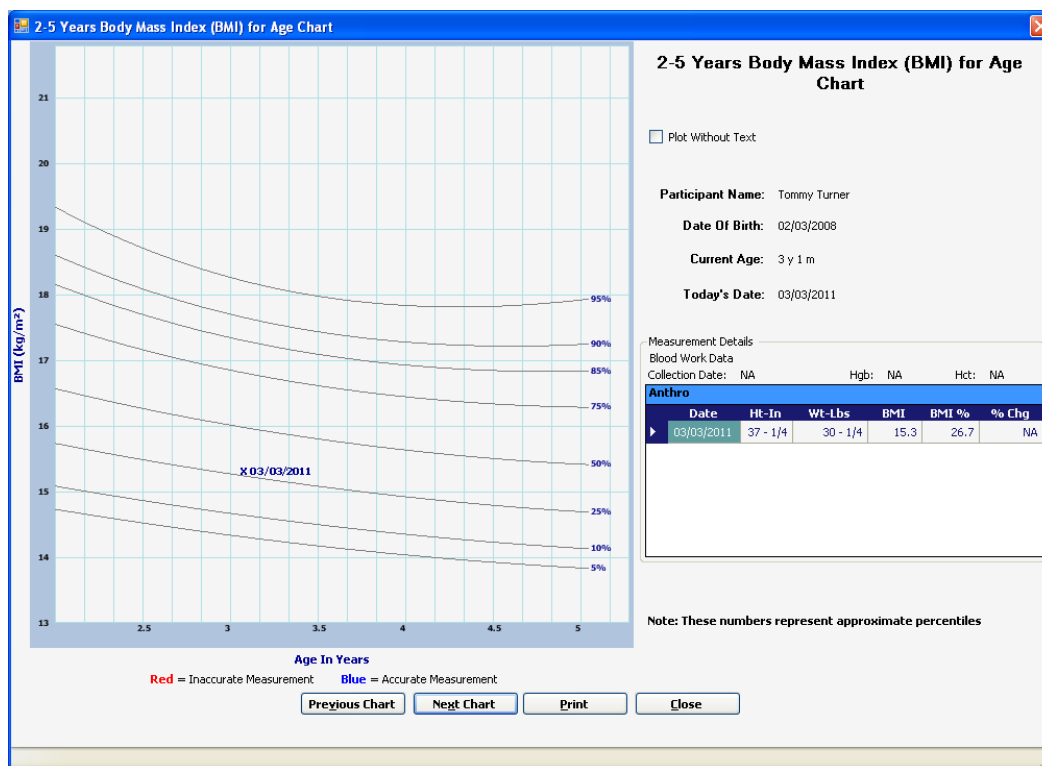


What does Tommy's growth grid tell us about his growth? The lines that cross the graphs and are labeled 5, 10, 25, 50, 75, 85, 90, & 95 are referred to as percentile or channel lines. On the stature for age grid Tommy's height falls just below the 50th percentile "channel" line around the 39<sup>th</sup> percentile. This tells us that 61% of the boys Tommy's age are taller than he is and 39% are shorter. We would expect in the future that Tommy will continue to grow and that the next time we see Tommy his new height at his new age will still fall around the same percentile "channel" line. Weight alone cannot tell you if a child is over or underweight. It depends on how tall the child is.

Tommy's weight for age is just slightly above the 25th percentile channel line, at the 31.1 percentile. This tells us that he weighs less than about 69 percent of the children his age and more than 31% of the children his age. Weight for age does not in and of itself tell us if Tommy is underweight or overweight.

Tommy's BMI for age is at the 26.7 percentile and is considered within the normal range.

BMI for Age Chart:



## Prenatal Weight Gain

A woman's weight gain during pregnancy is **very important** in influencing the outcome of her pregnancy. Women who do not gain adequate weight during pregnancy are more likely to give birth to low birth weight (LBW) infants. Low birth weight is currently a leading cause of infant mortality. Infant mortality refers to the death of a baby before his or her first birthday. These infants are less likely to be healthy at birth, are more likely to have serious medical complications, and longer hospital stays. Excessive weight gain during pregnancy can also have negative effects. Excessive weight gain is associated with complications such as gestational diabetes and difficulties during delivery. Excess weight may also stay with a woman after pregnancy, thus impacting her health for the future.

Because of the strong impact weight gain has on pregnancy, screening for optimal weight gain has become an integral part of the WIC Program. At certification, pregnant women are weighed and the weight is entered into the Anthropometrics panel. This weight measurement will be automatically plotted on the Prenatal Weight Gain Chart. Weeks gestation is measured in increments of two weeks. Weight is plotted in increments of four pounds. Weights at follow-up visits are entered and plotted on the chart to enable us to monitor the weight gain pattern. By tracking a woman's weight gain on the Prenatal Weight Gain Chart,

recommendations can be made to help a woman make changes in her diet for an optimal outcome to her pregnancy.

Pregravid or pre-pregnancy weight is the weight of a woman before conception. There are two aspects of weight gain, which are important to monitor in pregnancy. One is the total **amount** of weight gain and the other is the **rate** of weight gain. The recommended amount of total weight a woman should gain during pregnancy is determined by her weight status before pregnancy or **pre-pregnancy BMI**.

To determine if a woman is normal weight, overweight, or underweight WIC uses BMI. The Compass system calculates BMI for each WIC participant. A woman's current BMI can be found on the Anthropometric panel.

Below is another resource for determining BMI if needed. The table displays the different BMI classifications: Underweight, Normal Weight, Overweight and Obese.

BMI Table for Determining Weight Classification for Women *				
Height (Inches)	Underweight BMI <18.5	Normal Weight BMI 18.5-24.9	Overweight BMI 25.0-29.9	Obese BMI > 30.0
58"	<89 lbs	89-118 lbs	119-142 lbs	>142 lbs
59"	<92 lbs	92-123 lbs	124-147 lbs	>147 lbs
60"	<95 lbs	95-127 lbs	128-152 lbs	>152 lbs
61"	<98 lbs	98-131 lbs	132-157 lbs	>157 lbs
62"	<101 lbs	101-135 lbs	136-163 lbs	>163 lbs
63"	<105 lbs	105-140 lbs	141-168 lbs	>168 lbs
64"	<108 lbs	108-144 lbs	145-173 lbs	>173 lbs
65"	<111 lbs	111-149 lbs	150-179 lbs	>179 lbs
66"	<115 lbs	115-154 lbs	155-185 lbs	>185 lbs
67"	<118 lbs	118-158 lbs	159-190 lbs	>190 lbs
68"	<122 lbs	122-163 lbs	164-196 lbs	>196 lbs
69"	<125 lbs	125-168 lbs	169-202 lbs	>202 lbs
70"	<129 lbs	129-173 lbs	174-208 lbs	>208 lbs
71"	<133 lbs	133-178 lbs	179-214 lbs	>214 lbs
72"	<137 lbs	137-183 lbs	184-220 lbs	>220 lbs
* Adapted from the Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults. National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH). NIH Publication No. 98-4083.				

The nine months of pregnancy are divided into three trimesters. The first trimester ends at 14 weeks and the second trimester ends at 27 weeks. The pre-pregnancy BMI is used to determine which types of lines are used for the target weight gain range. There is a minimum line that represents the lowest amount of weight gain in the recommended range and the maximum line that represents the highest amount of weight gain in the recommended range.

## Assessment for Pregnant Women

### Low Maternal Weight Gain – NRF 131 (High Risk)

Low maternal weight occurs any time during pregnancy when weight plots below the bottom line or below the recommended weight gain range on the Prenatal Weight Gain Chart in Compass. This risk factor is high risk and **user** assigned and must be recorded on the Anthropometrics or Risk panel in Compass.

### Maternal Weight Loss during Pregnancy – NRF 132 (High Risk)

- Any weight loss below pre-pregnancy weight during the first trimester (1-13 weeks gestation)
- Any weight loss of 2 pounds or more in the second or third trimesters (14-40 weeks gestation)
- This risk factor is high risk and system assigned.

### High Maternal Weight Gain – NRF 133 (High Risk)

High maternal weight gain occurs any time during a singleton pregnancy when weight plots above the top line or the recommended weight gain range on the Prenatal Weight Gain Chart. This risk factor is high risk and **user** assigned and must be recorded on the Anthropometric or Risk panel in Compass. \*Assign with singleton pregnancy only.

Low maternal weight gain, maternal weight loss during pregnancy and high maternal weight gain are all considered **high** risk. Low Maternal Weight Gain and High Maternal Weight Gain are assigned by the WIC staff member making the assessment. Low Maternal Weight Gain and High Maternal Weight Gain are manually assigned on the Anthropometric panel or in the Risk panel in Compass. Maternal Weight Loss during Pregnancy is system assigned by Compass. There should be a referral to the WIC High Risk Counselor within 30 days of the visit when these risk factors are identified. The same criteria should be used for multi-fetal gestation when assessing for low maternal weight gain.

In addition to the total **amount** of weight a woman gains during pregnancy the **rate** at which she gains weight has implications for a healthy outcome to pregnancy. Ideally a pregnant woman would follow her recommended weight gain curve. If you look at the weight gain curves on the Prenatal Weight Gain Chart you will notice that the majority of the weight gain occurs during the last 2 trimesters of pregnancy. It is not recommended that a woman gain all or even a third of her weight during the first trimester of pregnancy. Ideally her weight gain should be similar (though it does not need to be exactly the same) to the curves on the Prenatal Weight Gain Chart.

The target weight gain range for pregnancy is as follows:

### IOM Recommendations for Total and Rate of Weight Gain during Pregnancy

Pre-pregnancy BMI	BMI <sup>+</sup> (kg/m <sup>2</sup> )	Total Weight Gain (lbs.)	Range for Rates of Weight Gain 2nd and 3rd Trimester (lbs./week)
Underweight	<18.5	28–40	1 (1–1.3)
Normal weight	18.5–24.9	25–35	1 (0.8–1)
Overweight	25.0–29.9	15–25	0.6 (0.5–0.7)
Obese (includes all classes)	≥30.0	11–20	0.5 (0.4–0.6)

Source: <http://www.iom.edu/~media/Files/Report%20Files/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines/Resource%20Page%20-%20Weight%20Gain%20During%20Pregnancy.pdf>

## Helpful Hints

### Unknown Pre-pregnancy Weight

What if the woman does not know her pre-pregnancy weight? Most women will have some estimate of their pre-pregnancy weight. If the value seems reasonable in comparison to the woman's current weight use the estimated weight. Questions about weight gain or loss since becoming pregnant may also be useful in helping to estimate a woman's pre-pregnancy weight based on her current weight.

If a woman has no estimate of her pre-pregnancy weight and she is unsure if she has gained or lost weight compared to her current weight, it may be necessary for the WIC staff person to estimate the woman's pre-pregnancy weight. Does the woman appear to have been normal weight, underweight, or overweight right before she became pregnant? Discussion with the woman may help to answer this question.

In order to calculate unknown pre-pregnancy weight staff will need to use a current *Prenatal Weight Gain Chart* (see Appendix A). The estimated pre-pregnancy weight is done using current weight, the bottom line of the target weight gain range and current weeks gestation. For example, if a woman is currently 140 # and 12 weeks pregnant with a normal pre-pregnancy BMI, her estimated pre-pregnancy weight would be 138#. At 12 weeks the lower line of the target weight gain curve indicates she should have gained 2#.

Use this weight as her estimated pre-pregnancy weight in Compass. Note in her Compass education record that her pre-pregnancy weight is estimated. The same would be done for underweight, overweight, and obese women using their appropriate weight gain curves.

## Determining Weeks Gestation

How is the number of weeks gestation determined? WIC staff should use the number of weeks gestation calculated by Compass. The value given by Compass should always be used when recording data in WIC records. The week's gestation can be found on the Compass Pregnancy screen in Clinic Services and is also found in the heading under Weeks Gestation.

## Changes in the Expected Delivery Date – EDD

If a woman reports that her expected delivery date has changed since the previous visit, this information is updated in the Pregnancy panel in the Assessment portion of Clinic Services. Select the “Edit” button and change the EDD. The system will automatically update the LMP based on this information.

## Frequency of Weights during Pregnancy

How often should a woman be weighed during her pregnancy? Ideally at each WIC visit. WIC regulations require that a woman be weighed at least once each trimester while she is on the WIC Program. Because of the importance of a woman's weight gain in the outcome of her pregnancy, and because it is an easy measurement to obtain, it is recommended a pregnant women be weighed at all WIC visits.

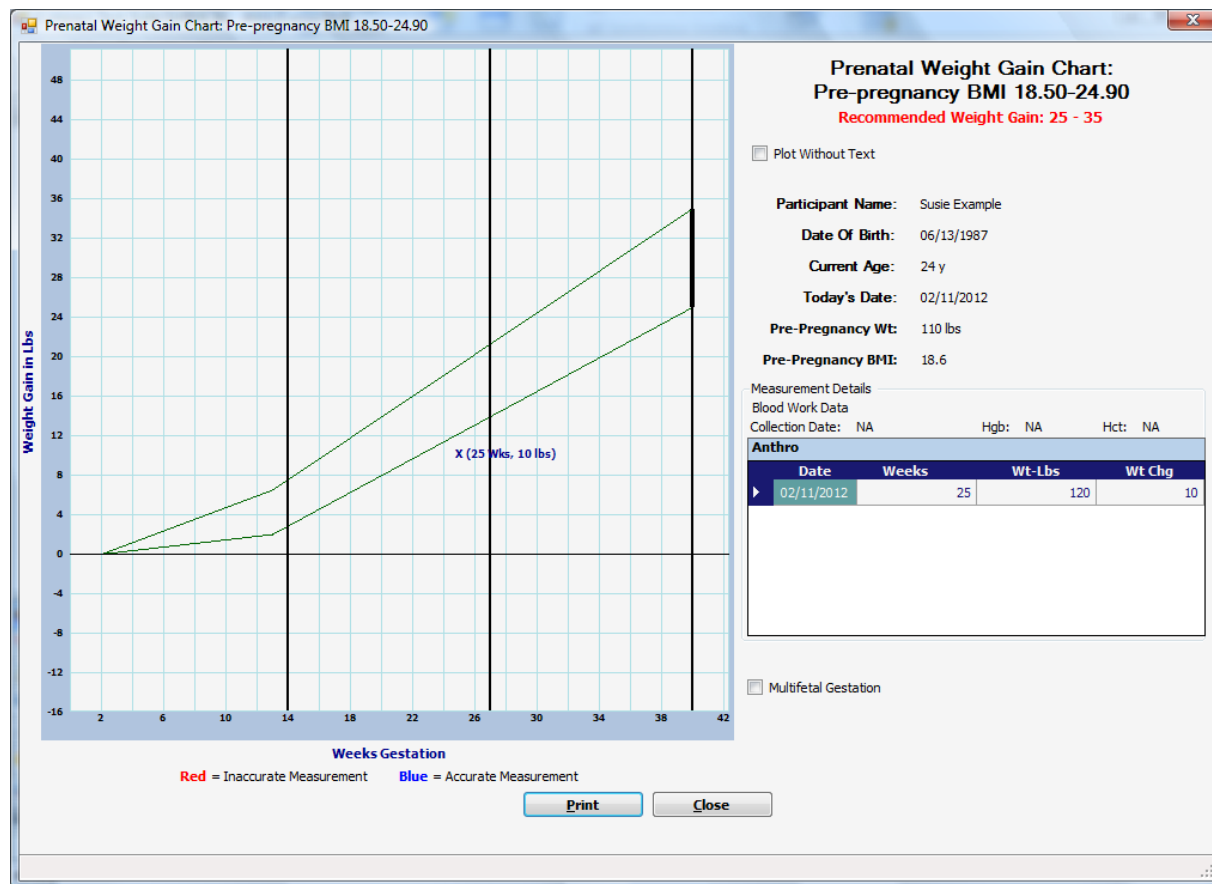
### *SELF-CHECK: PRACTICE YOUR KNOWLEDGE*

**Case Study: Refer to the Example Prenatal Weight Gain Chart for Susie Example on the following page.**

- Participant Name: Susie Example
- Date of Birth: 06-13-87
- Age: 24 years
- Today's Date: 2-11-12
- Expected Delivery Date: 6-1-12
- Pre-pregnancy Weight: 110 pounds
- Pre-pregnancy BMI: 18.6
- Weeks gestation: 25
- Current Weight: 120 pounds

1. What is the recommended weight gain range for Susie?
2. What risk factor should be assigned to Susie based on her weight gain?

## Section IV: Minimum Expected Weight Gain (MEWG) Tables



## ANSWERS

1. 25-35 pounds
2. NRF 131 – Low Maternal Weight Gain



## Section V: Iron Deficiency and Blood Collection

### Facts About Iron

Iron is a very important mineral for the human body. It is found in every cell of the body and is required for the normal function of each cell. Brain cells need iron to make special chemicals called neurotransmitters so that they can process thoughts. Muscles need iron so that they can get energy from food. The blood needs iron so that it can carry oxygen to all parts of the body. The immune system needs iron to kill bacteria that cause illness. Taste buds on the tongue need iron so that food tastes right. Even fingernails need iron so that they can be formed correctly.

Without adequate iron in the body, changes occur that gradually alter the way the body functions. A person will often feel tired and weak. Muscles can't get enough energy or oxygen to work properly. A person may look pale because their blood does not have enough red blood cells (the part of the blood that carries oxygen) and so they don't have much color. Children without adequate iron do not grow well (in height or weight) and their brains do not develop properly. Low iron can also cause the immune system to not function well so the person gets sick easily. Pregnant women with low iron are more likely to give birth to low birth weight and premature infants and low iron may cause complications during delivery. Food may start to taste "funny" and occasionally some people may even start to eat strange things like paint chips, dirt, or moth balls because of cravings not satisfied by food. This condition is called **Pica** which is the abnormal craving for substances that are generally not considered food. Pica can cause serious harm to a person and needs to be corrected.

**PICA:** Pica is the abnormal craving for substances that are generally not considered food. Items that a person typically may crave include dirt, ice, paint chips, moth balls, hair, and others. Pica can cause serious harm to a person and needs to be corrected. Pica was named after the Magpie bird (*Pica pica*) because magpies often search for food in garbage containers.

Iron is of special interest to WIC because the populations served by WIC are the most likely to be deficient in iron. Iron deficiency is the most common nutritional deficiency in the world, but it is most common in growing children and women, especially pregnant women. Severe iron deficiency can lead to one type of anemia, called iron-deficiency anemia. It is also more commonly seen in low income people. For this reason WIC regularly tests participants to determine if they are iron deficient.

### Iron-Deficiency Anemia

When a person does not get enough iron they stop making hemoglobin. Hemoglobin is a protein in red blood cells. Hemoglobin is what makes red blood cells look red and is where

most of the iron is located in the red blood cell. So the more hemoglobin there is in blood, the more iron in the body. Without hemoglobin the body stops making red blood cells. At some point the hemoglobin gets low enough that the person is said to be anemic. People who are anemic usually have a variety of symptoms; the most common one is that they feel tired. They often look pale, have trouble concentrating, feel cold, and can have some changes in their skin, tongue, and appetite.

If anemia gets severe a person will feel very poorly and the anemia can even become life threatening. It is important to note that different people react to anemia differently. Just because a participant says that she feels fine does not mean that she is not anemic. Some people become anemic with few symptoms, at least until the anemia becomes very severe.

### Detecting Iron Deficiency

It is impossible to tell if a person is low in iron by looking at them or by asking them how they feel. While symptoms such as feeling tired or looking pale may indicate low iron, these symptoms sometimes do not occur until a person's iron level is very low. Many factors affect how and when symptoms of iron deficiency appear. Some people show symptoms of iron deficiency more easily than others. The only way to be sure if a person has adequate iron is to do some type of blood test. There are two tests most commonly used to screen for iron deficiency: hemoglobin concentration and hematocrit. Most Colorado WIC clinics determine iron level by measuring hemoglobin. A few clinics perform the hematocrit blood test. Both tests are indicators of how much iron a person has in their body.

Blood is made of two major parts. One part is the red blood cells. The other part is called plasma. Plasma is a clear fluid that makes blood a liquid. Red blood cells float around in the plasma and make blood look red.

### Hemoglobin Test

Measuring hemoglobin concentration is a more accurate way to screen for iron deficiency than using a hematocrit values. To perform a hemoglobin test, blood is collected in a vessel that contains a substance that reacts with the blood to release the hemoglobin. The vessel is placed in a special instrument that measures the amount of hemoglobin by determining how red the blood appears to the analyzer.



### Hematocrit Test

Some participants may bring a hematocrit value taken at their doctor's to their WIC appointment. The value represents the amount of red blood cells in their blood. Because red blood cells contain large amounts of iron, the more red blood cells a person has the more iron they generally have in their body.

If you fill a tube with blood and spin it at very high speeds the red blood cells will separate from the plasma and fall to the bottom of the tube. The tube would then be filled with a clear fluid at the top and a bunch of red blood cells on the bottom. You can then measure the amount of red blood cells in the tube. If the tube is half-full of red blood cells and half full of plasma we would say that 50% (half) of the blood is red blood cells. Fifty percent would then be the hematocrit. If the tube were only one-third (33%) full of red blood cells and two-thirds (66%) full of plasma the hematocrit would be 33%. A hematocrit simply tells you what percentage of the blood are red blood cells. The more red blood cells you have the more iron you have in the blood. The more iron in the blood the more iron in the body. In general, normal hematocrit values are around 34-47%.

### **Variations in Normal Hemoglobin and Hematocrit Values**

Normal hemoglobin and hematocrit values vary according to age and sex, whether a person is pregnant, whether a person smokes, and by the altitude where a person lives. Infants tend to have lower values than older children. Women tend to have lower values than men. Pregnant women have lower values than women who are not pregnant (due to dilutional variances) and normal values vary according to the trimester of the woman's pregnancy. People who smoke or live at high altitudes tend to have higher values than people who do not smoke or who live at lower altitudes.

### **Smoking and Altitude**

Smoking and altitude cause "normal" hemoglobin and hematocrit values to be higher than usual. This should not be taken to mean that smoking or living at high altitude gives you more iron or makes you healthier. Smoking is a significant health risk for a pregnant woman, her unborn child, and her other children.

Smoking and living at high altitude make it difficult for the blood to absorb and carry adequate oxygen to the various parts of the body. The body tries to compensate for this difficulty by making extra blood cells. This increases the body's requirement for iron and makes hemoglobin values higher than normal. As an example, if a woman lived at sea level and had hemoglobin of 12.3 gm/dl, her hemoglobin would be considered normal. If she then moved to a city at 9000 feet above sea level her blood would have difficulty carrying enough oxygen and would try to make more red blood cells to raise her hemoglobin above 13.4 gm/dl to compensate. If her hemoglobin stayed at 12.3 gm/dl she would have difficulty exercising or carrying out normal daily activities. Her body would need more iron so that she could make more blood cells to carry adequate oxygen to body tissues such as muscle and brain.

### **Iron Deficiency Assessment**

Tables in your Mini Manual under the Assessment Tools section show values for hemoglobin and hematocrit that are below normal and are considered low. The values listed in the tables give the cut-off values to determine when the person does not have enough iron. When looking at the tables notice that one set of tables gives hemoglobin values while the other set gives hematocrit values. Within each set are two other tables. One table gives the value at

which iron is considered low and the other gives the values at which iron is considered severely low. Notice that on each table you need to know the elevation of your clinic, the age of the participant, whether the woman is pregnant and which trimester she is in, and finally, whether the woman smokes.

### **Low Hemoglobin/Hematocrit - NRF 201 (Low Risk)**

Categories: Children, infants, pregnant women, breastfeeding women and non-breastfeeding women.

Participants identified with low hemoglobin/hematocrit are considered low risk and the computer system will automatically assign this risk factor based on the information entered into the Blood panel of Compass.

### **Severely Low Hemoglobin/Hematocrit - NRF 201b (High Risk)**

Categories: Children, infants, pregnant women, breastfeeding women and non-breastfeeding women.

When a participant is identified with severely low hemoglobin/hematocrit:

- **And permission has been granted for WIC to contact the health care provider** – print two Abnormal Blood Work Notices. Give one copy of the Notice to the endorser/participant. On the second Notice, write in the WIC High Risk Counselor's name and contact information and fax or email that Notice to the health care provider within 24 hours. The participant must be seen within the next 30 days by the WIC High Risk Counselor.
- **And permission has not been granted for WIC to contact the health care provider** – print one Abnormal Blood Work Notice. Give this copy of the Notice to the endorser/participant and urge that it be shared with the participant's health care provider. Then, WIC staff must refer this participant to the WIC High Risk Counselor within 24 hours.

It is important for WIC staff members to remember that they are not diagnosing anemia. A diagnosis for anemia can only be made by a physician or other health care professional such as a physician assistant or nurse practitioner. The hemoglobin performed in the WIC clinic gives us the information to determine that the participant is likely to be low in iron, to assign the applicable nutrition risk factor, to guide education, and to help make appropriate referrals.

## **Hemoglobin Sample Collection**

In order to ensure accurate results, a standard procedure must be used each time a hemoglobin test is performed. The reference used by the Colorado WIC Program is: *Procedures and Devices for the Collection of Diagnostic Capillary Blood Specimens; Approved Standard- Sixth Edition; Vol. 28, No. 25; H04-A6, 2008 published by: Clinical and Laboratory Standards Institute\**.

Please refer to your local agency policy and procedures around blood collection for further information.

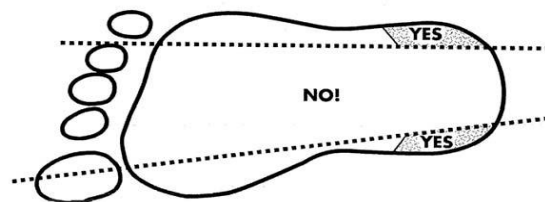
## Training Activity

### Colorado WIC Hemoglobin Testing training video

All new employees are required to view the **Colorado WIC Hemoglobin Testing training video** as part of the Colorado WIC Program training requirements. Click [here](#) to view the video.

### General Information for Blood Collection Procedure:

Gloves should be worn at all times during the testing procedure and all appropriate laboratory safety guidelines should be followed. Please refer to your local agency safety guidelines and procedures for reporting any blood or body fluid exposure.



The preferred blood collection site referenced in the *CLSI Standard\** for infants is the heel. Defer to your local agency standard for further guidance on blood collection for infants.

For children, blood is obtained from either middle finger. Blood flow is improved if the infants or child's foot/hand is massaged before a stick is made to draw blood. It is also helpful to keep the infant/child's foot or hand below the heart.

### Equipment

The following equipment is **required** to obtain a blood sample for the hemoglobin test:

- HemoPoint® H2 Analyzer
- Gloves
- Single-use lancet
- HemoPoint® H2 Microcuvettes (store at room temperature in the original container)
- Gauze or lint-free tissue
- Rubbing alcohol
- Adhesive bandages (as needed)
- Sharps container or other approved disposable container

**Lancet:** Device used to pierce the skin to draw blood.

Only single-use, disposable type lancets with retractable blades should be used.

**NEVER** reuse a lancet from one participant on another – this includes between a mother and her own child.

### A. Start Up Procedure

- Organize all of the equipment you will need to obtain a hemoglobin sample (such as lancet, microcuvette, Band-Aid).
- The analyzer does not have a separate On/Off-switch. It automatically switches to the Stand-by mode when you are not operating the instrument for a certain time (approximately 5 minutes). The display will go blank when in Stand-by mode. There are three ways of switching the analyzer ON again: touch the Touchscreen, open and close the cuvette holder, or plug the analyzer into an electrical power supply.
- “Open Holder” will display when the analyzer is in ready mode.

### B. Quality Control

The HemoPoint® H2 AutoCheck performs an internal check of the photometers optic system every time the cuvette holder is opened.

### C. Capillary Testing

- Remove a microcuvette from the container and close the lid immediately.
- Make sure that the participant is sitting comfortably.
- Wearing suitable protective gloves, lightly massage the fingers, in order to stimulate the circulation. There should be good blood circulation in the hand from which you wish to take blood. Warm water can be used to warm cold hands if needed.
- Only use the middle or ring finger. The participant should not be wearing a ring on the finger used for sampling.
- Clean the puncture site with alcohol. Wipe off the alcohol with clean, dry lint-free gauze or allow it to air dry completely.
- Position the lancet device so that the puncture will be on the side of the fingertip. Press the lancet device firmly against the side of the finger prior to activating the lancet to aid in obtaining a good sample.
- Discard the lancet in a sharps container.
- Using dry gauze or other lint-free tissue, blot away the first drop of blood, press gently applying light pressure as needed again until another large drop of blood appears. This stimulates blood flow and lessens the likelihood of a dilutional effect by interstitial fluid (the fluid in between the cells). AVOID excessive squeezing or “milking the finger” to obtain a blood sample.

#### Caution:

Always use clean gauze or other swab. If it falls on the floor, throw it away. Never reuse swabs or gauze between participants.

- Hold the center tip of the microcuvette in the middle of the drop of blood and wait until the cuvette is filled completely. DO NOT fill from the side as this could create air bubbles and provide an invalid result.



- Make sure the drop of blood is big enough to fill the microcuvette completely with one continuous flow. DO NOT try and top-off a partially filled microcuvette. Repeat the process with a new drop of blood and a new microcuvette.
- Visually inspect the microcuvette for air bubbles. If air bubbles are present, discard the microcuvette and redo.
- Wipe off any excess blood from the outside of the microcuvette using clean gauze or lint-free tissue, taking care not to touch the open end of the microcuvette.
- Open the cuvette holder of the analyzer completely. “Add Cuvette” will be displayed on the touchscreen.
- Upon opening, the analyzer performs an internal self-check which takes 1 – 2 seconds. Release the cuvette holder and do not touch it again until the process is finished and an audible signal (beep) occurs.
- The filled microcuvette should be analyzed immediately or within 10 minutes after it has been filled. Properly insert the filled microcuvette into the cuvette holder. Gently push on the cuvette holder and it will close automatically. Do not force!
- Testing of the microcuvette begins automatically. “Testing” will be displayed on the touch screen.
- The result will be displayed within 10-60 seconds. Record the hemoglobin value. Opening the cuvette holder will start a new testing cycle.
- Open the cuvette holder, take out the used microcuvette and discard it in the sharps container or appropriate biohazard container, following local procedures for disposal. Discard any items used in blood collection into the sharps or other biohazard container.
- Remove gloves and wash hands thoroughly with soap and warm water.
- Once at your desk, enter the result into the Compass Blood panel.

## D. Maintenance

### Cuvette Holder

Disconnect the power adaptor from the electrical connection before proceeding.

- The cuvette holder should be removed from the analyzer at the end of each day for cleaning.
- Open the cuvette holder until you feel a resistance and the holder will not extend further.
- Press down the silver pin on the left-hand side (bottom) of the cuvette holder with a ball-point pen and draw the cuvette holder forward at the same time.
- The cuvette holder can be cleaned with a mild soap solution. To disinfect, a 10% bleach solution or a standard solvent-free solution can be used. Allow the cuvette holder to dry completely before placing it in the analyzer.
- To replace the cuvette holder, simply push it in the correct position into the opening in the housing until it engages.

### Analyzer

Disconnect the power adaptor from the electrical connection before proceeding.

- Clean the touch screen and the analyzer with a lint-free cloth lightly dampened with clean water. For more stubborn soiling, a mild soap solution may be used. To disinfect, a 10% bleach solution or a standard solvent-free solution can be used for surface disinfection. DO NOT use alcohol or sprays to clean the analyzer.
- The optical unit should be cleaned when the following error message is displayed “Dirty Optics – Use Optics Cleaner.” To clean the optronic unit, refer to the HemoPoint® H2 User’s Guide (pages 48 –49) located in each clinic.

Do not be discouraged if at first it is difficult to obtain good results with hemoglobin measurements. It takes practice. Continue to practice and soon you will be able to obtain accurate hemoglobin quickly, even from a screaming child! Your supervisor will observe you performing a hemoglobin measurement using the *Observation Checklist*. This checklist is part of Level I and usually completed once all Level I modules and online Compass Training is completed. The checklist can be found on the Colorado WIC webpage.

## Frequency of Hemoglobin Screening

### Hemoglobin Screening for Pregnant Women

#### Required

- Certification Visit

WIC requires that hemoglobin screening be performed on pregnant women at their certification visit. Adequate iron is critical during pregnancy. A woman who does not have adequate iron is more likely to give birth to a low birth weight or premature infant. She is more likely to have complications during her pregnancy and have difficult labor. The only way a woman can know if her iron is adequate is by testing. A pregnant woman who is found to have severely low hemoglobin/hematocrit levels should be designated as high risk and referred as indicated.

### Hemoglobin Screening for Postpartum Women

#### Required

- Breastfeeding Woman - At certification after delivery.
- Non-Breastfeeding Woman - At certification after delivery.

Non-breastfeeding postpartum and breastfeeding postpartum women are required to have their hemoglobin measured at their first certification after delivery. Pregnancy results in a huge loss of iron from the woman’s body. Some iron is used to form the infant and to give the infant a supply of iron for the first few months of life. During delivery a woman loses blood, the placenta, and other tissues, which contained large amounts of iron. Some of this iron



needs to be replaced. It is important for the woman to replace this iron to meet the needs of her own body as well as to ensure that she has adequate stores should she become pregnant in the near future. It takes a long time to completely replace the iron lost during pregnancy.

## **Hemoglobin Screening for Infants**

### Required

- Any infant who is initially certified between 6 and 11 months of age must have a hemoglobin screening at the certification visit.
- Any infant who is not routinely receiving an iron source at 9 months of age, such as iron fortified formula, iron-fortified cereals, meats, or oral iron supplements must have a hemoglobin screening at that time or at 3 months after their initial certification if they were certified after 7 months of age.

Infants are born with a store of iron in their bodies that they receive from their mothers during pregnancy. Infant iron stores usually last 4-6 months. Because of this, hemoglobin screening is not routinely performed to certify infants on the WIC Program except in certain circumstances as listed below:

- Infants initially certified on the WIC Program between 6 and 11 months of age must have a hemoglobin screening performed at the time of certification.
- All infants who do not routinely receive an iron source at 9 months of age, such as iron-fortified formula, iron-fortified cereals, meats, or iron supplements must have hemoglobin screening performed at that time or at 3 months after their initial certification if their initial certification was at 6, 7, or 8 months of age.

## **Hemoglobin Screening for Children**

### Required

- Certification/Recertification Visit at 12 months
- Certification/Recertification/ Mid-Certification Visit at around 18 months
- Then, one time per year at Certification/Recertification/Mid-Certification Visits after 18 months

Children are required to have their hemoglobin screened at their certification/recertification visit at one year of age, at certification/recertification or mid-certification at around 18 months, and then once a year thereafter as long as their hemoglobin value is within normal limits. If a child has low or severely low hemoglobin, it should be repeated every 5-7 months until it is normal (at recertification &/or mid-certifications).

\* A child who is certified between 13-17 months must have a hemoglobin screening at their mid-certification visit at 19-23 months. Around 18 months is when a significant number of children become anemic. In order to identify these anemic children it is important to check their hemoglobin at 18 months or shortly afterwards (up until 23 months). Once this hemoglobin has been collected and, if it is normal, then hemoglobin screening only needs to be repeated one time per year.

\*\* If both of the values at 12 and 18 months are within normal limited, then once a year thereafter as long as their hemoglobin values remain within normal limits.

### Examples of Required Data for Infant and Children Visits based on Time of Certification

#### Child Certified at 1 Year of Age

12 months	18 months	24 months
Length Weight Nutrition Interview Hemoglobin/ Lead Screening Immunization Records** Update BFin Description as necessary	Length Weight Nutrition Interview Hemoglobin/ Lead Screening Immunization Records**	Length Weight Nutrition Interview Hemoglobin/Lead Screening* Immunization Records**

\*Hemoglobin value required one time per year after 18 months if the previous value was normal. Otherwise Hemoglobin test is required at each certification.

#### Child Certified at 16 Months of Age

16 months	22 months	28 months
Length Weight Nutrition Interview Hemoglobin/ Lead Screening Immunization Records**	Length Weight Nutrition Interview Hemoglobin/ Lead Screening Immunization Records**	Length Weight Nutrition Interview Hemoglobin/Lead Screening* Immunization Records or Verbal Immunization Assessment

\*Hemoglobin value required one time per year after 22 months when the previous value was normal. Otherwise Hemoglobin test is required at each certification.

## **Hemoglobin/Hematocrit Tests Performed Outside of the WIC Clinic**

Hemoglobin/hematocrit tests may be performed by WIC staff or by other medical personnel who are qualified to perform these tests. A participant may bring a hemoglobin/hematocrit value from their health care provider's office for certification as long as:

- For a woman: The hemoglobin/hematocrit value must have been obtained during the physiological state the woman is being certified for. For example, for a pregnant woman, the hemoglobin/hematocrit must have been performed at some time during the current pregnancy for which she is being certified. For a breastfeeding or postpartum woman the hemoglobin/hematocrit must have been performed after the end of the woman's most recent pregnancy.
- For an infant or child: The hemoglobin/hematocrit must have been performed between 9-12 months of age, again between 15-18 months of age, and at least yearly after 18 months of age assuming the previous value was normal. If the previous value is abnormal the hemoglobin/hematocrit should be repeated every 6 months until a normal value is obtained and then yearly thereafter.

WIC staff need to have some assurance that hemoglobin/hematocrit tests performed outside the WIC office are by qualified personnel and that the values presented by the WIC participant are the true values which were determined. The value should be written on paper (such as a prescription pad) that shows its source.

### **What if a child is uncontrollable and highly agitated so that a hemoglobin screening cannot be performed?**

A WIC participant may be certified without a hemoglobin value under such circumstances as long as they have another qualifying nutrition risk factor. The participant must be scheduled for a repeat screening attempt within 90 days of their certification date unless the participant has a personal, cultural, or religious belief that does not allow the test to be performed. When a hemoglobin test is refused the reasons must be documented in the participant's care plan.

## **Repeat Hemoglobin When Low Values Are Obtained**

How soon should hemoglobin tests be repeated if values are found to be low? This depends on the situation and the policy of the local WIC clinic. If the low hemoglobin has been reported to the participant's primary care provider who will monitor the situation, there may not be any need for a repeat test until the participant's next recertification. If the participant has no health care provider the participant should be encouraged to obtain health care and report the low value to the health care provider who can then follow it. Severely low hemoglobin values that make participants high risk, need to be referred to the WIC High Risk Counselor who will make the determination as to when or if follow-up hemoglobin tests should be performed in the WIC clinic.

Low hemoglobin values do not change quickly even when supplemental iron is given. If a clinic has a policy of repeating low values, the repeat test should be performed one month or

more after the low value was obtained. The timing for repeat measurements, however, depends on the circumstances and the severity of the low hemoglobin value.

WIC resources may only be used for one repeat hemoglobin test per certification period.

### **High Hemoglobin Values**

Occasionally a person being certified will have a hemoglobin value that is considered “high.” While there are no nutrition risk factors associated with “high” hemoglobin values there may still be concerns that need to be addressed. Very high hemoglobin values can be associated with certain kinds of blood diseases, carbon monoxide poisoning, and for pregnant women, higher risk of premature labor and delivery of a low birth weight infant. High values should be uncommon. Whenever a high value is encountered staff may want to consider repeating the test to confirm the value. Technique should be reviewed to ensure that the test is being performed properly.

### **Pregnant Women**

High hemoglobin values during pregnancy are associated with premature birth and delivery of a low birth weight infant. Women with high values should be referred to their primary health care provider with information about the level obtained in the WIC clinic. The primary care provider will then have to assess the hemoglobin value as a part of the woman’s total health and the progress of her pregnancy. A woman should not stop taking her prenatal vitamin with iron. It is thought that high hemoglobin values in pregnancy are often the result of inadequate plasma expansion and not because of too many red blood cells or too much iron.

In some cases a woman may have an elevated hemoglobin level because she is dehydrated. This could occur with severe nausea and vomiting. In such cases the woman should be instructed to increase her fluid intake and consult with her primary care provider.

There are no precise values for determining when hemoglobin is “high” for a pregnant woman. In general, values greater than 17 mg/dl should be referred to a physician.

### **Children**

High hemoglobin values in children are also uncommon. When high values are identified they should be confirmed and the participant should be given the information to share with their primary care provider (PCP) at their next PCP visit. True high values can be indicative of a number of conditions that need to be reviewed by a physician. A child who is dehydrated due to a condition such as illnesses with vomiting and diarrhea may have high hemoglobin and should be encouraged to drink adequate fluids. Cut-off values, which determine when hemoglobin is excessively high, have not been determined.

The tables in your Mini Manual under the Assessment Tools section give normal values for hemoglobin and hematocrit. The tables show the minimal values that are considered normal. Look at one of the tables and notice that the ones for children indicate normal values based on age and the altitude at which the child lives. The tables for pregnant women use altitude, smoking, and trimester of pregnancy to determine the minimal normal value.

When certifying a participant on the WIC Program the Compass computer will risk the person for low hemoglobin/hematocrit without WIC staff having to look up these values. Severely Low Hemoglobin/Hematocrit; NRF 201b is manually assigned by the WIC staff person and needs a referral to the WIC High Risk Counselor per protocol.

For the following participants, give the hemoglobin level that would result in them being assigned the NRF 201 for low hemoglobin/hematocrit and for NRF 201b severely low hemoglobin/hematocrit.

1. Pregnant woman who lives in Lakewood (elevation 5440 feet) is in her third trimester. She does not smoke.

NRF 201\_\_\_\_\_ NRF 201b\_\_\_\_\_

2. Breastfeeding woman who lives in Durango (elevation 6512 feet) and is a non-smoker.

NRF 201\_\_\_\_\_ NRF 201b\_\_\_\_\_

3. Postpartum woman smoker (1/2 pack of cigarettes per day) who lives in Leadville (elevation 10,152 feet).

NRF 201\_\_\_\_\_ NRF 201b\_\_\_\_\_

4. Three-year-old child who lives in Springfield (elevation 4365 feet).

NRF 201\_\_\_\_\_ NRF 201b\_\_\_\_\_

5. What is the iron-containing substance found in red blood cells that combine with oxygen to deliver oxygen to the cells of the body?

6. List three symptoms that indicate a person may have anemia:

A.  
B.  
C.

7. A person can be sure that they are not anemic if they do not feel tired.

A. True      B. False

8. Complete the following describing when hemoglobin screenings are required:

A. Pregnant woman with prenatal care:

\_\_\_\_\_

B. Two-year-old child who with normal hemoglobin:

\_\_\_\_\_

C. Five-day-old infant who is receiving iron-fortified formula:

\_\_\_\_\_

D. Infant receiving iron-fortified formula who is being certified at seven months of age:

\_\_\_\_\_

E. Breastfeeding woman (10 days postpartum):

\_\_\_\_\_

F. Three-year-old child with low hemoglobin:

\_\_\_\_\_

9. Under what condition a hemoglobin test must be performed on a nine-month-old infant who was originally certified at 5 days of age?

10. A pregnant woman comes into WIC to be certified on the WIC Program. She just found out that she is 4 weeks pregnant. She had blood work done at her physician's office 2 months ago and has brought paperwork from the physician's office showing her hematocrit. She would rather not be poked again for a hemoglobin value. What two conditions determine whether the hemoglobin or hematocrit value from the physician's office may be accepted for her WIC certification?

A.

B.

### ANSWERS

1.	NRF 201	<11.5 gm/dl	NRF 201b	<10.3 gm/dl
2.	NRF 201	<12.3 gm/dl	NRF 201b	<10.6 gm/dl
3.	NRF 201	<14.5 gm/dl	NRF 201b	<12.6 gm/dl

4. NRF 201 <11.3 gm/dl NRF 201b <9.6 gm/dl
5. Hemoglobin
6. Symptoms of Anemia: Tired, pale, poor brain development or function, increased infections or illness, altered taste or appetite, deformed finger nails, poor growth, changes in the skin or tongue, muscle weakness, low birth weight, premature birth, complications during delivery.
7. B, False
8.
  - A. At certification
  - B. Once every year
  - C. Not until the infant is recertified as a child at one year of age
  - D. At certification
  - E. At certification
  - F. At each mid-certification and recertification until the hematocrit is normal.
9. When the infant is not routinely receiving an iron source after 6 months of age. Iron sources include iron-fortified formula, iron-fortified infant cereal, meat or oral iron supplements.
10.
  - A. The hematocrit/hemoglobin value may not be more than 60 days old.
  - B. The hematocrit/hemoglobin must have been performed while the woman was pregnant for this pregnancy.

## Precautions to Prevent the Spread of Infection

Please refer to your local health department policies and guidelines for universal precautions around blood collection.

### Universal Precautions:

Universal precautions are work practices that help prevent contact with blood and certain other body fluids. They include use of protective barriers such as gloves, gowns, masks and goggles. They also include work practices such as proper disposal of sharps and proper hand washing.

#### The spread of germs:

1. Airborne
2. Direct Contact
3. Fecal-oral Route
4. Blood Contact

This section of the module presents a set of guidelines that all WIC staff should follow to protect themselves and participants from infections while working in the WIC clinic. All people carry viruses and bacteria in their bodies. Many of these viruses and bacteria can make another person sick if they are transferred in the right way. This section of the module gives information on how to prevent the spread of disease from one person to another. This information is important in the WIC clinic and in your personal life outside of the WIC clinic.

### There are four ways that germs (bacteria and viruses) can be spread:

**Airborne.** This happens when people sneeze or cough. They may sneeze directly on you or they may sneeze into their hands and then touch doorknobs, railings, papers, pens, or pencils. When you touch these objects you get the germs. Wash your hands often to protect yourself. Cover your mouth when you cough or sneeze and then wash your hands. As much as possible avoid people who are coughing and sneezing, especially if they are close by and/or do not cover their mouths.

**Direct Contact.** Direct contact between two people can sometimes result in transmission of disease. Body lice can be transmitted from one child to another by direct contact. Certain skin diseases can be spread by direct contact. Open wounds and infections can spread germs through direct contact. If someone has an infection in their eye they can transmit it to you by rubbing their eye and then shaking hands with you. When you rub your eye you then get their germs and their infection in your eye. Again, wash your hands often. Avoid contact with open wounds or infections of another person.

**Fecal-Oral Route.** Fecal-Oral contamination is more common than you may think. It can be a problem in a WIC clinic. Kids with dirty diapers provide plenty of fecal matter. Also anyone who uses the restroom without washing their hands may provide fecal material. The amount of fecal matter may be very small, so small you cannot even see it. It may be on a toy, a doorknob, the measuring board, etc. If you touch any of these and then eat your lunch without washing your hands, you will get the fecal germs. Protect yourself by simply washing your hands.



**Blood and Body Fluid Contact.** ANY body fluid, but especially blood, can transmit infection from one person to another. Some of these infections can be pretty serious, so pay attention. If you follow some simple precautions you will keep yourself from being at risk and you will not put participants at risk. Always wear gloves when coming into contact with blood and body fluids. Do not touch fluids that come out of the human body, especially blood and feces. In WIC we perform hemoglobin and/or hematocrit tests and we work with infants and children (who have dirty diapers or are in contact with other children with dirty diapers), so there is potential for you to contact another person's body fluids. Do not touch body fluids. If you do come in contact with another person's body fluids wash your hands or other place on your body where you came into contact with the fluid!!

**Here are some ways to protect you from diseases spread by feces, blood, and other body fluids:**

Whenever you may come in contact with body fluids, wear gloves. This includes when you are taking blood or cleaning up a mess that might include body fluids such as changing a child's diaper, cleaning up feces, urine, and/or vomit. Hand washing is required when you remove the gloves. When you are performing a hemoglobin test continue to wear your gloves or get a new pair as long as you are handling any equipment that may be contaminated with blood (such as removing the microcuvette from the HemoPoint® H2Analyzer). Do not wear the gloves you use to collect blood to operate your computer. Germs are very small. You cannot see them. Gloves need to be discarded after use and between participants. Always discard gloves in designated sharps or other specified containers. Do not carry germs from one participant to another.

Wash your hands. Wash your hands. Wash your hands- especially after handling infants and children-wash your hands.

If an accident does occur where blood or feces get on equipment or the counter top, clean those surfaces with a disinfecting solution and wear gloves. This can happen when parents change their children's diapers during height and weight measurements. Wash the counter with disinfectant and wash your hands.

Wash your hands after coughing, sneezing, or blowing your nose. Keep your hands out of your face and hair. Do not bite or chew your nails. Do not place objects such as pens and pencils in your mouth. They are not clean and may be contaminated.

All materials that are saturated with blood or body fluids need to be disposed of in a special way. For example, cotton used to clean up excess blood off a participant's finger should be disposed of in a special biohazard container or bag. NEVER touch the cotton ball contaminated with blood with your bare hands. Remember, to wear gloves and wash your hands afterwards. Do not throw any materials with blood contamination into the normal garbage.

Wash your hands. Wash your hands. Wash your hands. Wash your hands when you go on a break, before and after lunch, after you use the bathroom, and before you go home.

Regularly clean surfaces where infants and children are placed. Use a disinfectant. Wear gloves when disinfecting and wash your hands when done. If your clothes get splashed or soaked with blood or body fluids from another person, remove the clothes, wash the area of contact on your body, and report the incident to your supervisor. Your supervisor will give you instructions on how to handle the situation and on how to properly clean your clothes.

Wash your hands. Are you starting to see a trend here? Washing your hands is one of the single most important measures you can take to keep yourself from getting sick at work or at home.

Sharp objects such as lancets used for pricking a participant's finger or the capillary tube used to measure a person's hemoglobin need to be disposed of in a special Sharps container that is labeled as a biohazard. These containers are designed to prevent the lancet or capillary tubes from accidentally puncturing anyone while disposing of these items. Some of the most serious types of infections occur when blood from one person (as on a used lancet) is injected into another person (as when the lancet somehow pricks someone else's finger during disposal). NEVER, NEVER, NEVER use the same lancet on more than one person, even when one person is the mother and the other is a child.



In the extremely rare event that someone, including yourself, gets stuck with a used lancet or capillary tube wash the area immediately with lots of soapy water and notify your supervisor IMMEDIATELY. There are types of medical treatment that can help prevent infection under these conditions.

If you ever stick yourself (or anyone else) with a used lancet or other sharp object notify your supervisor IMMEDIATELY. In the extremely rare event that blood is splattered on your skin or an open cut/wound, notify your supervisor IMMEDIATELY. Clinics must have procedures in place to report, assess, and provide treatment when these types of accidents occur.

### **Hand Washing Technique:**

Use soap. Liquid soaps are better than bar soaps. Bar soaps can carry germs from one person to another. Wash your hands under warm running water. Rub your hands together for at least 30 seconds while washing them. Wash your whole hand including top, bottom, between fingers, and under nails. Rinse hands well and let water runoff of your fingertips. Dry hands with a clean paper towel and then use the paper towel to turn off the faucet (remember that

you turned on the faucet with your dirty hands!). Cloth towels should not be used to dry your hands if you intend to reuse them even once. Throw paper towels away after use. You should always wash your hands after using the restroom, before and after eating, after handling any body fluids, changing a child's diaper, disinfecting equipment, when you arrive at the clinic in the morning and before you go home and, if possible, between each participant with whom you have close contact (as in weights and lengths for infants).

*SELF-CHECK: PRACTICE YOUR KNOWLEDGE*

1. The single most important action you can take to prevent the spread of infection is\_\_\_\_\_.
2. What are the four ways that germs can be spread?  
A.  
B.  
C.  
D.
3. Used single use lancets can be disposed of in any biohazard garbage container.  
  
A. True      B. False
4. After taking blood it is important to keep your gloves on until you have discarded the filled cuvette.  
  
A. True      B. False
5. When is it acceptable to reuse a lancet to get blood from more than one person?
6. What should you do if you accidentally stick yourself with a used lancet?

*ANSWERS*

1. Hand washing
2. A. Airborne  
B. Direct Contact  
C. Fecal-Oral Route  
D. Blood & Body Fluid Contact
3. False. It must be a biohazard sharps container.
4. True.
5. NEVER
6. Wash the puncture site with lots of soapy water and notify your supervisor immediately.

## Section VI: Additional Screening Requirements

### Elevated Blood Lead Levels

The Colorado WIC Program requires a blood lead level screening and referral for every infant or child at their one year certification appointment or upon enrollment of a child. When lead screening information is provided to the WIC clinics, the local agency staff members need to determine if the lead level meets the criteria for “lead poisoning.” The cut-off value for lead poisoning is  $\geq 10\mu\text{g}/\text{dl}$ .

If the infant or child has not had a test, staff members must make a referral to their health care provider or another program where the test can be obtained. Staff members record this information on the Blood panel in the Assessment branch of Compass indicating *no* in the drop down asking if the test was performed in the last year and *unknown* for the lead level.

If an infant or child has had a lead test performed in the last year, record *yes* in the drop down. Ask for results of the lead test and if known, input the value. Dependent on this value, answer “yes/no/or unknown” if the lead level was 10 ug/dl or higher. An elevated blood level is considered high risk and must be referred to the WIC High Risk Counselor within 30 days. However, participants should clearly understand that blood lead screening and referral procedures will not be used to deny eligibility for WIC services or nutrition assistance.

### HIV Status

The Colorado WIC Program is mandated to advise all pregnant, postpartum, and breastfeeding women to know their HIV status. Our role is to provide information regarding the risks of transmitting HIV from mother to baby during pregnancy and delivery and the importance of getting early medical treatment to reduce the risk to their baby and to inform all women that HIV positive mothers should not breastfeed.

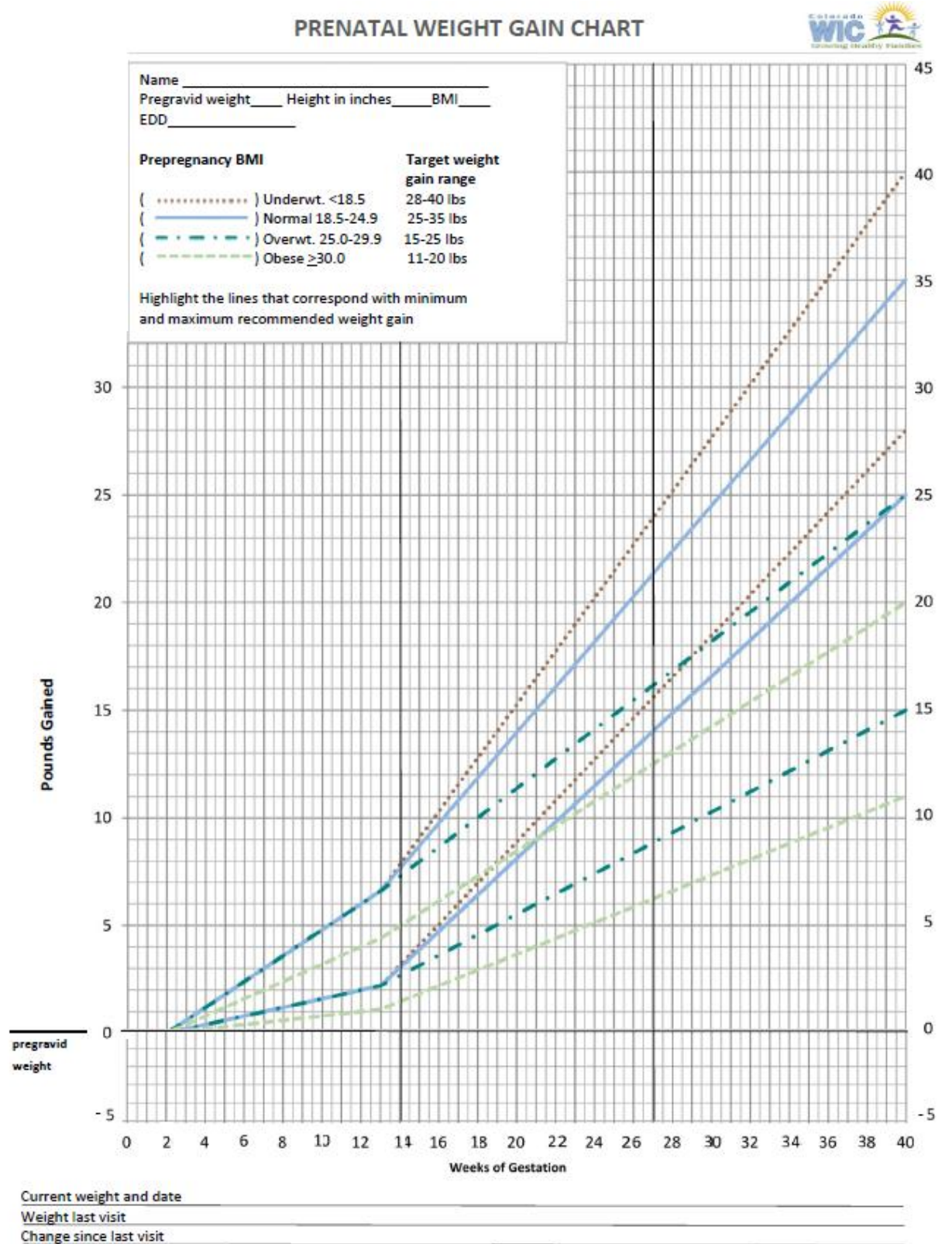
## Training Activity

Once you have completed this module, please take the on-line test. For access instructions please visit the Colorado WIC website. **Best of Luck!**

**Check for these charts in your Mini Manual**

- Hematocrit Levels Indicating Risk
- Hemoglobin Levels Indicating Risk
- Standards for Severely Low Anemia (hematocrit)
- Standards for Severely Low Anemia (hemoglobin)

# Appendix A- Prenatal Weight Gain Chart



WIC # 124 (revised 09/10)